Part Number 72084

Tsunami MP.11
Recommended Antennas
Version 2.3

PROXIM WIRELESS

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SAFETY AND REGULATORY INFORMATION

See the Tsunami MP.11 product CD for important Safety and Regulatory Information.

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Introduction

ABOUT THIS BOOK

This manual supplements the Proxim *Tsunami MP.11 Antenna Installation Guide*.

The *Antenna Installation Guide* explains how to install and set up an outdoor antenna with the Tsunami MP.11 hardware devices.

This guide does not explain how to erect antenna masts, nor how to install a safety grounding system. These prerequisites must be in place before installing the directional antenna.

Who Should Use This Manual

The installation of outdoor wireless links requires technical expertise. At the very least, you should be able to:

- Install and configure the network components, such as the radio hardware.
- Understand, or have a working knowledge of, installation procedures for network operating systems using Microsoft Windows.
- Mount the outdoor antenna and surge arrestor. Antenna installation must be provided by professional installers.

WARNING!

The outdoor antennas to be used with these products are intended for mounting on an antenna tower, on a roof, or on the side of a building. Installation is not to be attempted by someone not trained or experienced in this type of work. The antenna must be installed by a suitably trained professional installation technician or by a qualified antenna installation service. The site prerequisites must be checked by a person familiar with the national electrical code and with other regulations governing this type of installation.

Local radio regulations or legislation may impose restrictions on the use of specific combinations of:

- Low-loss antenna cables and outdoor antennas
- Radio channels selected at the radios that are connected to specific outdoor antennas

Note: A basic rule for selecting a combination of cables and antennas is that no combination is allowed unless explicitly approved in the *Tsunami MP.11 Antenna Installation Guide* for your MP.11 model. Therefore, always use *Tsunami MP.11 Recommended Antennas* in combination with "Chapter 2. Determining Range and Clearance" of the *Antenna Installation Guide* to select the correct type of antenna equipment and to inform your antenna installer and LAN administrator about the impact of regulatory constraints on their job or activities.

CAUTION ***At all times, it is the customer's responsibility to ensure that an outdoor antenna installation complies with local radio regulations.[1] The customer must verify that:***

- ***The antenna installer is aware of these regulations***
- ***The correct cable type and surge arrestor have been used, according to the instructions described in this document***

Proxim Wireless Corporation and its resellers or distributors are not liable for any damage or violation of government regulations that may arise from failing to comply with these guidelines.

[1] In case you are not certain about the regulations that apply in your country, consult your local Proxim Wireless Corporation Sales Office.

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ANTENNA TYPES

Wireless radios generate signals on a given frequency. Antennas distribute that signal through the air in a particular pattern. Antennas take a given power output and make it reach further by reducing directions along which the signal is radiated. Concentrating the signal on your workspace makes better use of your wireless radio's power output, Stations inside your workspace get stronger coverage and, therefore, higher speed. Directing the signal where you want it also means less signal where you don't want it; stations outside your workspace get little or no coverage.

Directional antennas (omni, sector, parabolic, flat) provide maximum range, but due to their narrow beamwidth, these antennas require precise antenna alignment to achieve optimal performance. The higher the antenna gain, the more precise the alignment should be.

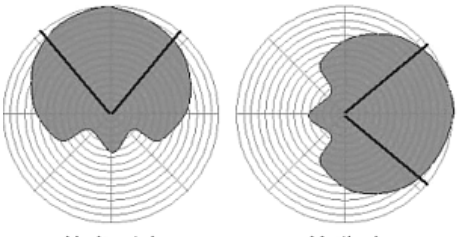
Directional antennas are typically used to connect:

- A Base Station Unit and a Subscriber Unit in a point-to-point link
- A Subscriber Unit in a point-to-multipoint network

Flat Panel Directional Antennas

Flat panel directional antennas are mounted flush on walls or ceilings. They produce hemispherical coverage, spreading away from the mount point at a width of 30 to 180 degrees. Concentrating the signal on this smaller area further increases range.

Flat Panel



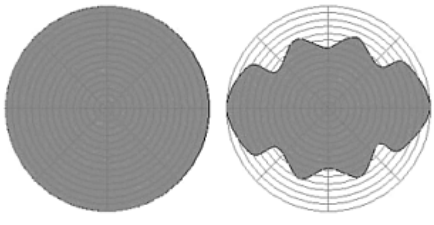
Horizontal **Vertical**

Omni-Directional Antennas

Like dipole antennas, Omni antennas radiate the signal 360 degrees horizontally; however, they increase gain by flattening the signal, producing a vertical beam between 80 degrees (modest gain) and 7 degrees (high gain). Gain makes the signal travel further.

These antennas have an omni-directional azimuth pattern that makes them easy to install. There is also a gain-to-beamwidth relation for omni-directional antennas: The higher the gain of the omni-antenna, the narrower the vertical beamwidth. In a hilly terrain, an 8 dBi omni-directional antenna can be a better solution than the 10 dBi omni-directional antenna to avoid missing part of the terrain with too narrow a beam.

Omni Antenna



Horizontal **Vertical**

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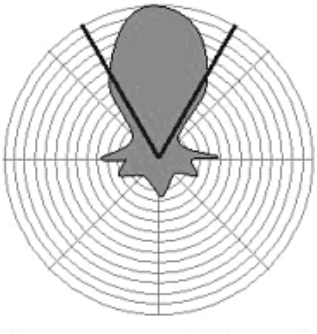
Sector Antennas

Sector antennas are high-gain directional antennas. These cylinders contain a boom supporting thin vertical rods. The signal propagates off the front of the boom. Note that some signal (back lobes) fall behind the boom. Sector antennas create higher gain by producing narrower beams (20 – 80 H, 14 – 64 V).

The wide-angle sector antenna is a good Base Station antenna for hilly terrain. It combines a wide opening angle "sector" with relatively high gain. The mounting brackets allow tilting of the antenna. This antenna also is used when the amount of traffic in a cell is too high for a single Base Station with an omni-directional antenna. The wide-angle antenna allows dividing the cell into three sectors that each can be serviced by a Base Station.

Sector Antenna

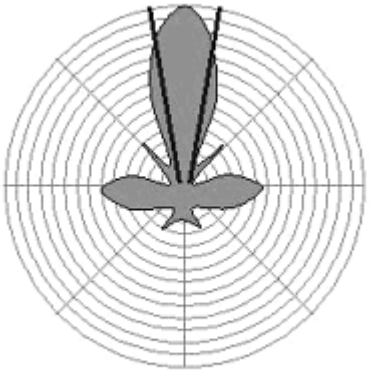


Horizontal and Vertical

Parabolic Dish Antennas

Parabolic antennas are concave panels or bowls that produce an extremely narrow beam (4 – 25 degrees horizontal / vertical).

Parabolic Antenna



Horizontal and Vertical

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Summary

Omnis

Are better for high-ceiling industrial and retail environments, such as factory floors, warehouses, or “big box” stores in which antennas can be suspended from the ceiling at the center of large open areas. But Omnis are not good in long, narrow workspaces in which antennas cannot be centrally located.

Panel

Panel antennas are better for covering single-floor small offices, small stores, and other indoor locations in which wireless radios cannot be placed centrally. For example, mount panel antennas unobtrusively on the back wall of a store. Back lobes do create some leakage, but far less than an omni-directional antenna would in the same situation.

Sector

Sector antennas are better for corridors, hallways, tunnels, long narrow buildings, and point-to-point medium range connections between outdoor bridges (for example, connecting two buildings in an office park or campus). Be wary of back lobes, but the sector’s narrow beam will reduce unwanted peripheral exposure in the focal direction.

Parabolic

Parabolic antennas are better for long-range outdoor point-to-point connectors, such as bridges that are miles apart. They require more precise installation to aim signal where you want it, but have the very high gain necessary to reach such distances.

Notes:

- All Proxim radios require professional installation.
- Antennas with gain less than 8 dBi are not allowed.
- Antennas of other makes can be used with the HZB-US5358-11A device (5054-R), but must be of the same type, dimensions, and gain as those listed.

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Recommended 5.8 GHz Antennas

- Omni-Directional Antennas
- Sector Antennas
- Flat Panel Antennas
- Parabolic Antennas

OMNI-DIRECTIONAL ANTENNAS

- 8 dBi Omni-Directional Antenna (5054-OA-8)
- 10 dBi Omni-Directional Antenna (5054-OA-10)
- Other Recommended Omni Antennas

8 dBi Omni-Directional Antenna (5054-OA-8)

Part Number 5054-OA-8

Electrical Specifications

Frequency Range	5470 MHz – 5875 MHz
VSWR	2.0 : 1 maximum
Nominal Impedance	50 ohms
Average/Peak Gain	7.8/9.0 dBi @ 5.5 GHz 8.1/9.4 dBi @ 5.7 GHz
HPBW/horizontal	360 degrees
HPBW/vertical	12 degrees
Polarization	Linear, vertical
Electrical Downtilt	2 degrees
Power handling	5W (cw)
Connector type	Standard N female

Environmental and Mechanical Specifications

Wind Survival (per EIA-222-F at 100' height)	216 km/hr
Temperature range	-40 to +90 degrees C
Humidity	95% @ 25 degrees C
Lightning protection	DC ground
Size	78 x 80 x 384 mm
Radome color	Gray-white
Radome material	Fiberglass
Weight	230 g

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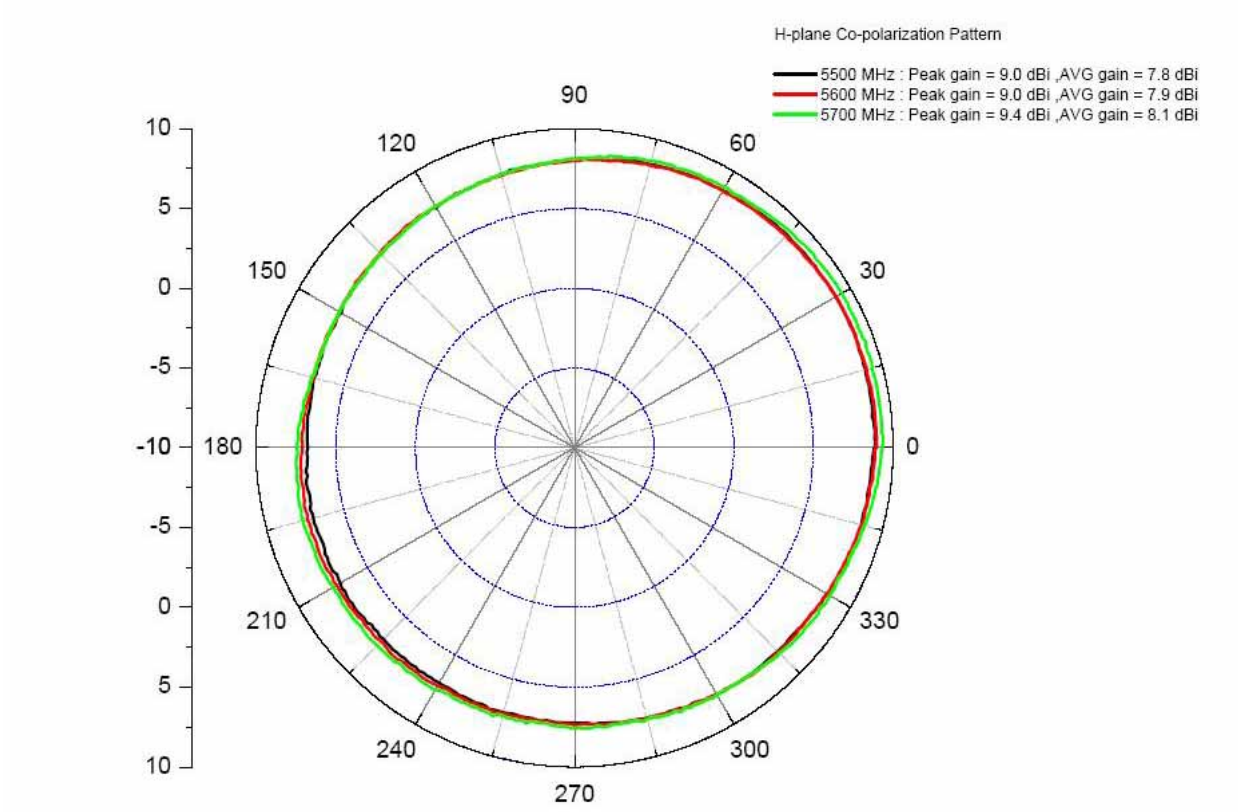
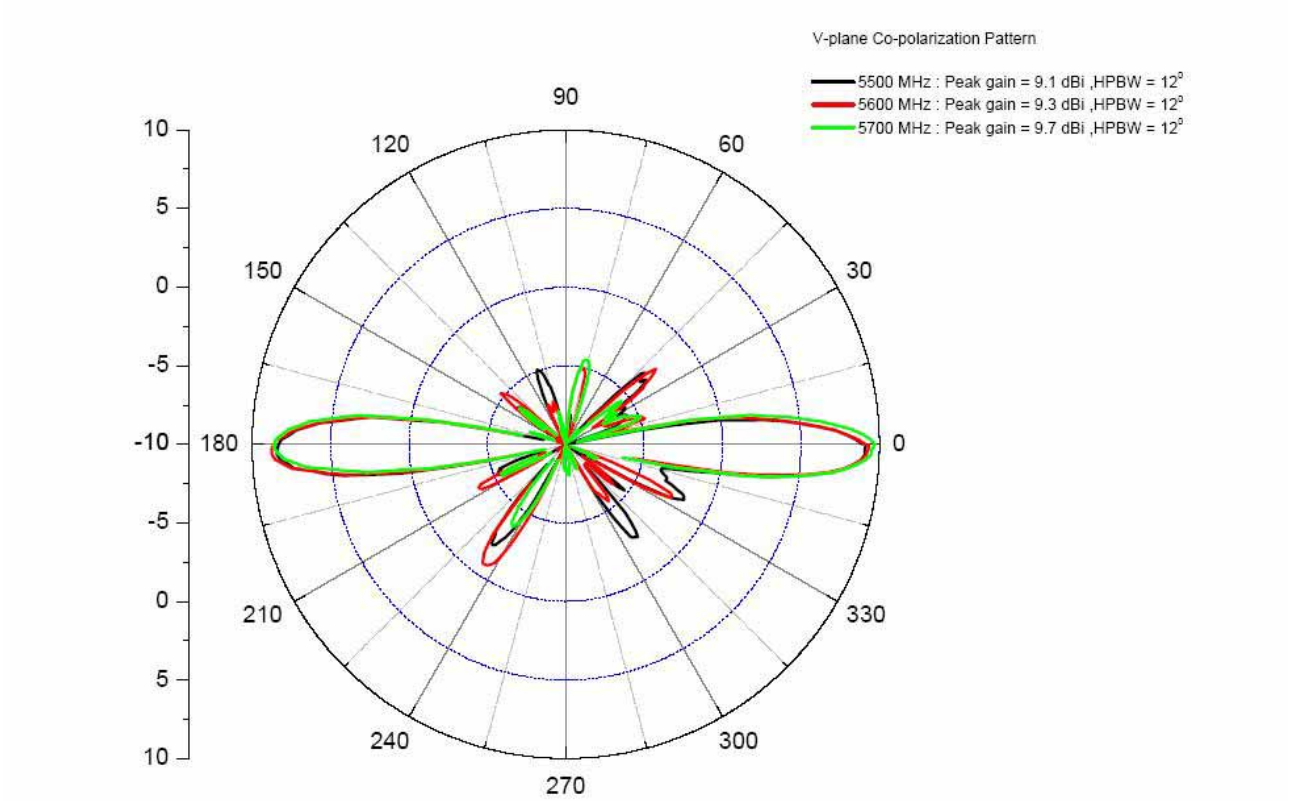
Antenna Patterns 5054-OA-8





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10 dBi Omni-Directional Antenna (5054-OA-10)

Part Number 5054-OA-10

Electrical Specifications

Electrical	
Frequency Range	5470 MHz – 5875 MHz GHz
VSWR	2.0 : 1 maximum
Nominal Impedance	50 ohms
Gain	10 dBi
HPBW/horizontal	360 degrees
HPBW/vertical	6 degrees
Polarization	Linear, vertical
Downtilt	2 degrees
Power handling	5W (cw)
Connector	Standard N female

Environmental and Mechanical Specifications

Wind Survival (per EIA-222-F at 100’ height)	216 km/hr
Temperature range	-40 to +90 degrees C
Humidity	95% @ 25 degrees C
Lightning protection	DC ground
Size	78 x 80 x 515 mm
Radome color	Gray-white
Radome material	Fiberglass
Weight	270 gw

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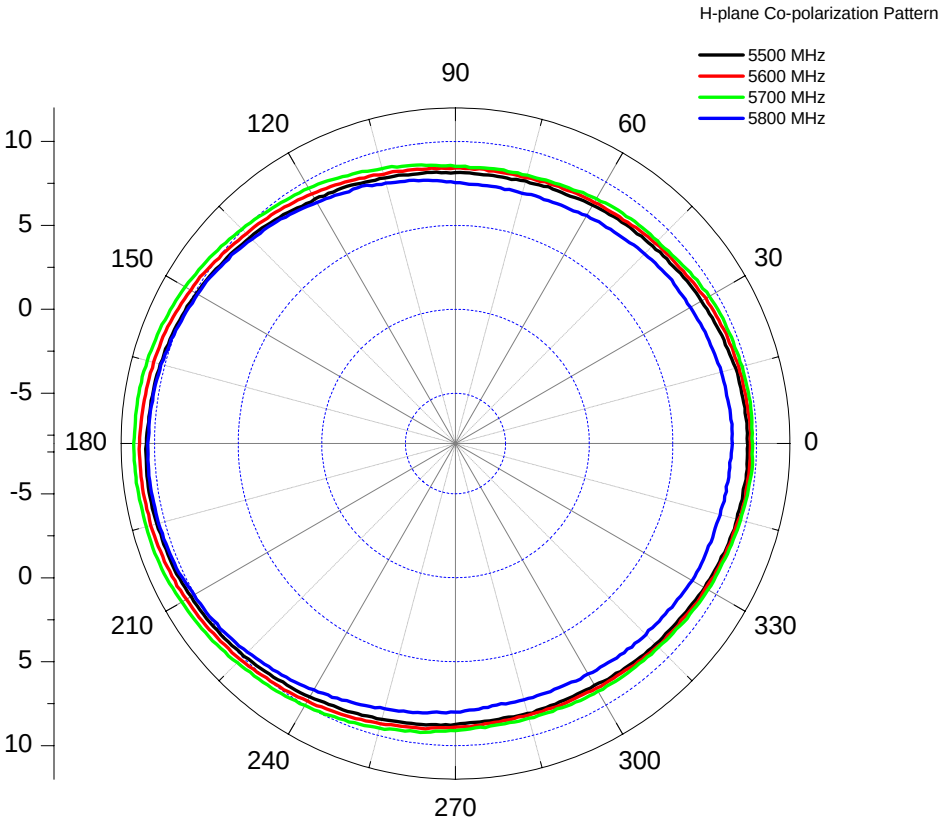
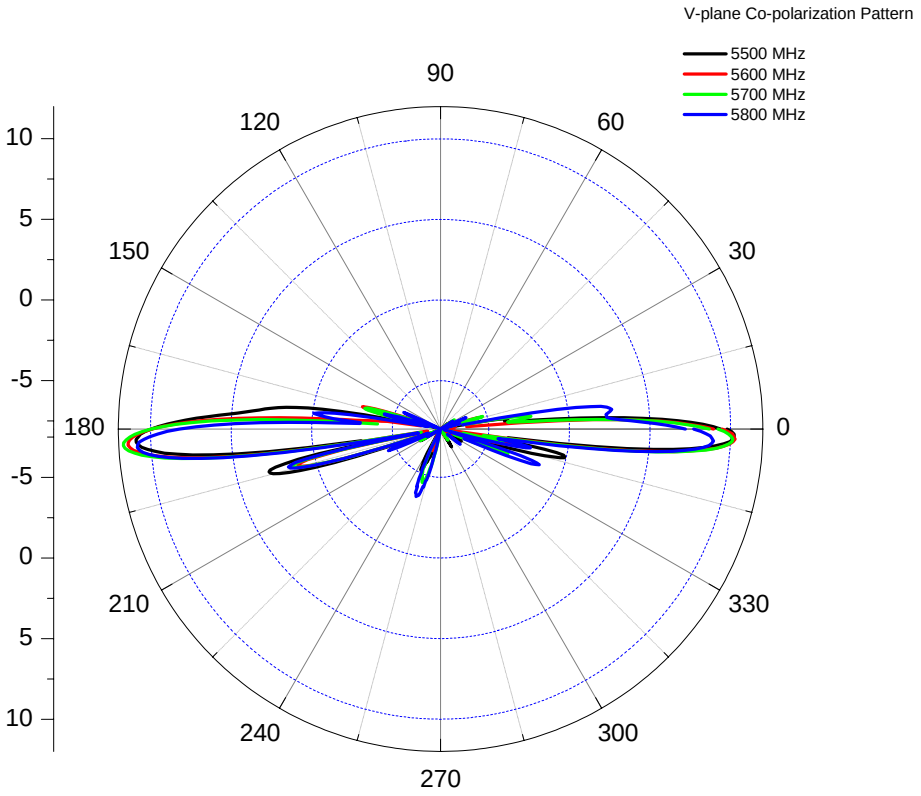
Antenna Patterns 5054-OA-10





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Other Recommended Omni Antennas

Type	Manufacturer	Model Number	Frequency Range	Mid-Band Gain
Omni	Mars	MA-WO58-9X	5.47 – 5.875	9
	MTI	MT-482003/N	5.15 – 5.875	9
	MTI	MT-482009/N	5.725 – 5.875	12
	MTI	MT-483003/N	5.725 – 5.875	12
	Stella Doradus	52 1360	5.1 – 5.3	7
	Stella Doradus	52 2360	5.1 – 5.3	10
	Stella Doradus	52 3360	5.1 – 5.3	13
	Stella Doradus	58 1360	5.7 – 5.8	7
	Stella Doradus	58 2360	5.7 – 5.8	10
	Stella Doradus	58 3360	5.7 – 5.8	13
	Telex	5830	5.725 – 5.85	7.5
	RadioWaves	OMN-H-5-8	5.725 – 5.85	8 (hor pol)

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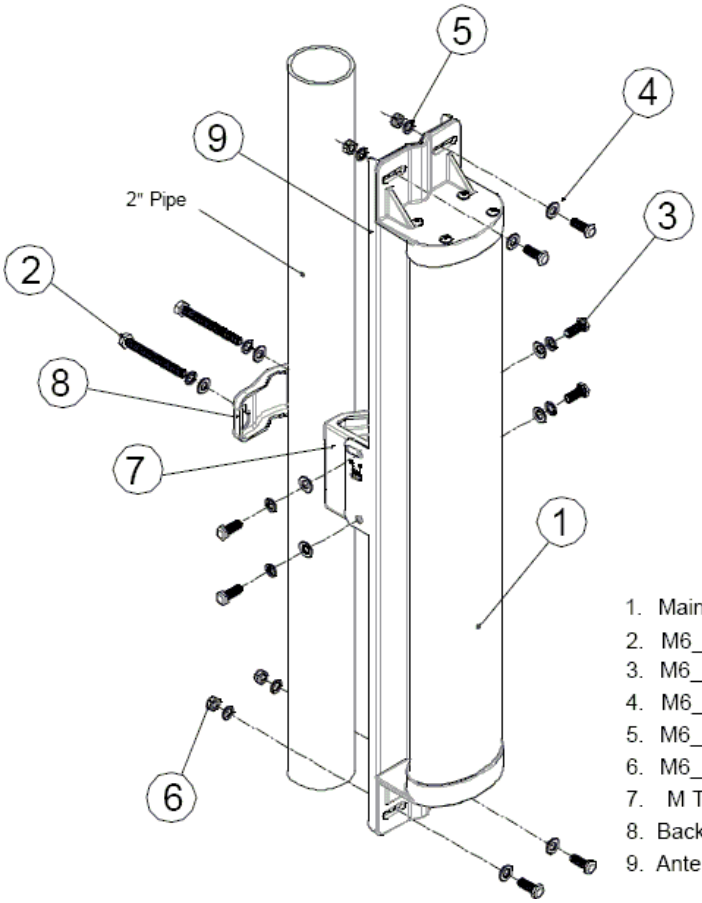
SECTOR ANTENNAS

- 14 dBi Sector 120 degrees
- 17 dBi Sector Antenna (60°)

14 dBi Sector Antenna (120°)



1.	Main body	1pcs
2.	M6_60mm Bolt	2pcs
3.	M6_16mm Bolt	8pcs
4.	M6_Washer	8pcs
5.	M6_S/Washer	8pcs
6.	M6_Nut	4pcs
7.	M Type Braceket	1pcs
8.	Back Support Plate	1pcs
9.	Antenna Support Plate	1pcs

5054-SA120-14

Electrical Specifications

Frequency Range	5150 MHz – 5875 MHz
VSWR	2.0 : 1 maximum
Nominal Impedance	50 ohms
Gain	13.5 dBi
HPBW/horizontal	120 degrees
HPBW/vertical	6 degrees
Polarization	Linear, vertical
Downtilt	0 degrees
Power handling	5W (cw)
Connector	N-type Female

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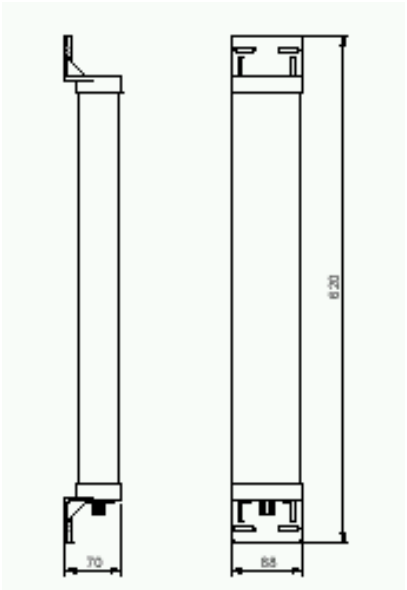
Environmental and Mechanical Specifications

Wind Survival (per EIA-222-F at 100’ height)	216 km/hr
Temperature range	-40 to +80 degrees C
Humidity	95% @ 25 degrees C
Lightning protection	DC ground
Size	620 x 88 x 70 mm
Radome color	Gray, white
Radome material	ABS
Weight	590 gw
Mechanical tilt	+10 .. 0 or 0.. –10 degrees

Mechanical Layout



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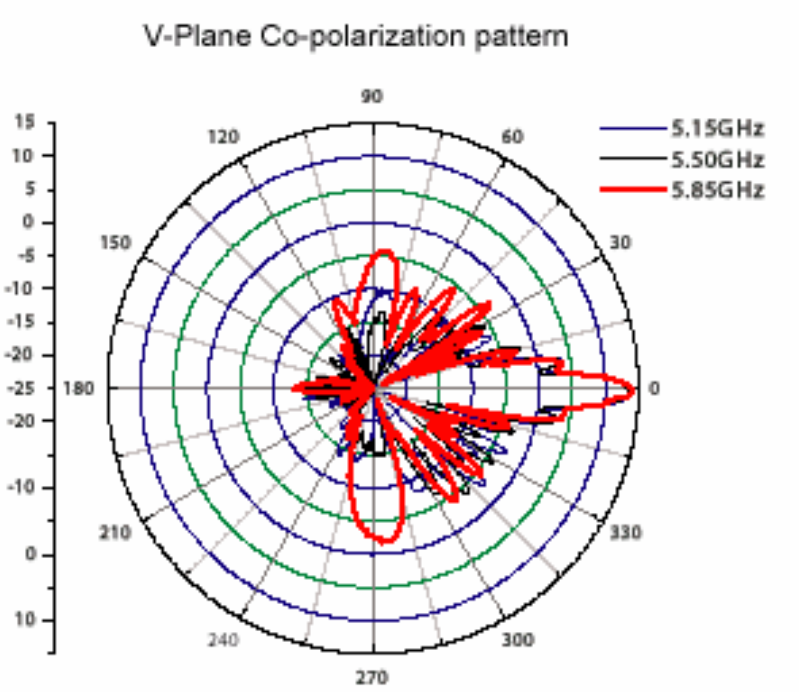
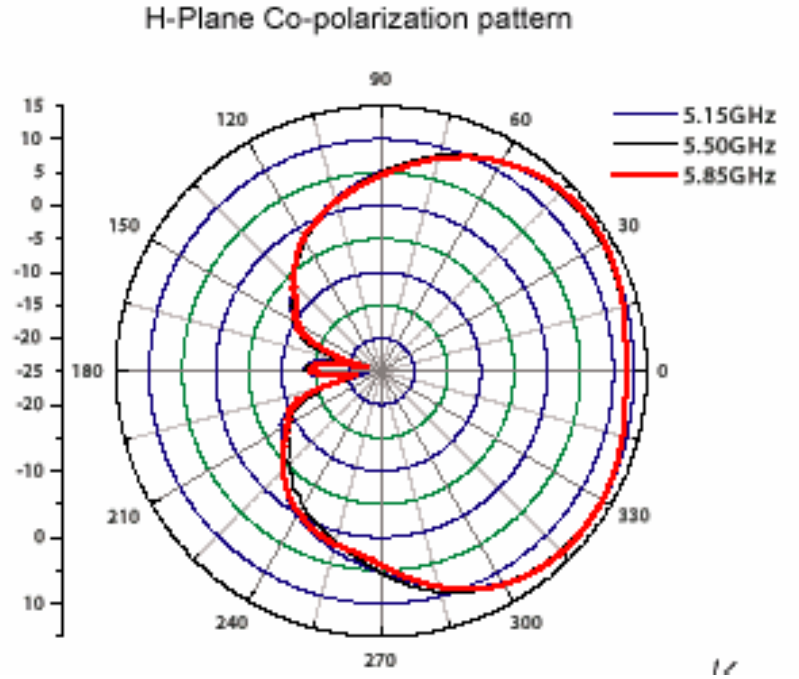
Antenna Patterns 5054-SA120-14





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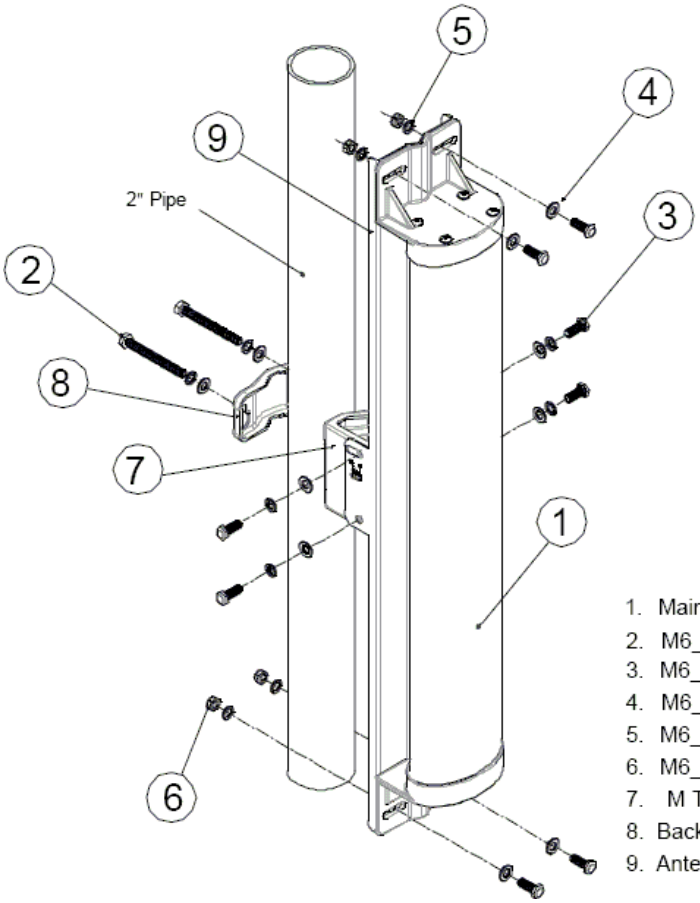
17 dBi Sector Antenna (60°)



1.	Main body	1pcs
2.	M6_60mm Bolt	2pcs
3.	M6_16mm Bolt	8pcs
4.	M6_Washer	8pcs
5.	M6_S/Washer	8pcs
6.	M6_Nut	4pcs
7.	M Type Braceket	1pcs
8.	Back Support Plate	1pcs
9.	Antenna Support Plate	1pcs

Part Number 5054-SA60-17

Electrical Specifications

Frequency Range	5150 MHz – 5875 MHz
VSWR	2.0 : 1 maximum
Nominal Impedance	50 ohms
Gain	16.5 dBi
HPBW/horizontal	60 degrees
HPBW/vertical	6 degrees
Polarization	Linear, vertical
Downtilt	0 degrees
Power handling	5W (cw)
Connector	N-type Female

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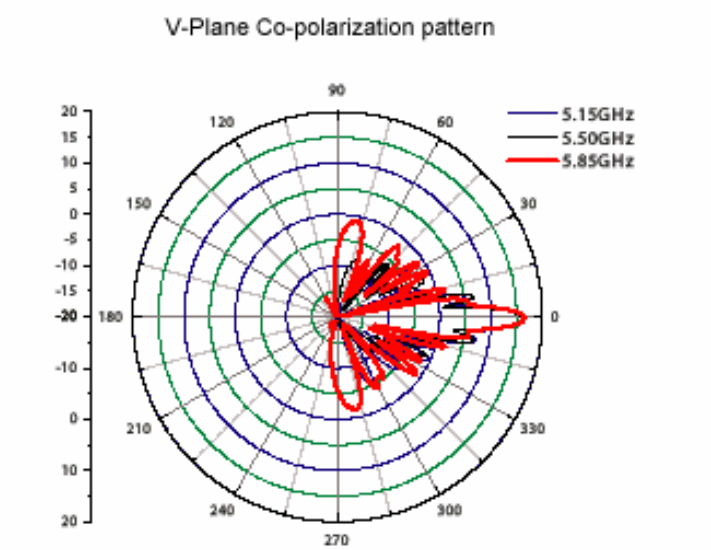
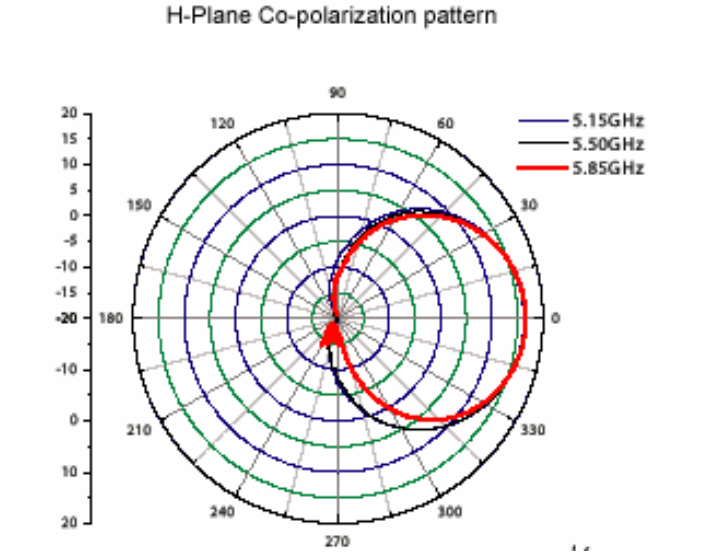
Environmental and Mechanical Specifications

Wind Survival (per EIA-222-F at 100' height)	216 km/hr
Temperature range	-40 to +90 degrees C
Humidity	95% @ 25 degrees C
Lightning protection	DC ground
Size	620 x 88 x 70 mm
Radome color	Gray, white
Radome material	ABS
Weight	565 gw
Mechanical tilt	+10 .. 0 or 0.. –10 degrees

Antenna Patterns





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Other Recommended Sector Antennas

Type	Manufacturer	Model Number	Frequency Range	Mid-Band Gain
Sector 60 degrees	Mars MTI MTI MTI RadioWaves RadioWaves	MA-WC50-5X MT-484026/NV MT-484026/NH MT-484033/NV SEC-55H-60-17 SEC-55V-60-17	5.15 – 5.85 5.15 – 5.875 5.15 – 5.875 5.15 – 5.875 5.25 – 5.85 5.25 – 5.85	17 16 (Null-Fill) 15 (h pol, NF) 16.5 17 (hor pol) 17
Sector 90 degrees	Mars MTI MTI MTI RadioWaves RadioWaves Telex Telex	MA-WD50-6X MT-484027/NV MT-484027/NH MT-484032/NV SEC-55H-90-16 SEC-55V-90-16 5801 5840	5.15 – 5.875 5.15 – 5.875 5.15 – 5.875 5.15 – 5.85 5.25 – 5.85 5.25 – 5.85 5.725 – 5.825 5.725 – 5.825	16 14 (Null-Fill) 14 (h pol, NF) 17 16 (hor pol) 16 12 15
Sector 120 degrees	Mars MTI MTI RadioWaves RadioWaves	MA-WE50-7X MT-484034/NV MT-484034/NH SEC-5V-120-14 SEC-5V-120-16	5.15 – 5.875 5.15 – 5.875 5.15 – 5.875 5.725 – 5.85 5.725 – 5.85	14.5 16.5 16.5 (hor pol) 14 16

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PANEL ANTENNAS

- 18 dBi Panel Antenna
- 15 dBi Panel Window Antenna
- 23 dBi Panel Antenna

18 dBi High Gain Directional Panel Antenna for 5.25 to 5.875 GHz

Pictured: SmartAnt antenna

Part Number 5054-PA-18

Electrical Specifications

Frequency Range	5.25 GHz – 5.785 GHz
VSWR	1.5: 1 maximum
Nominal Impedance	50 ohms
Gain	18 dBi
HPBW/horizontal	18 degrees
HPBW/vertical	18 degrees
Polarization	Linear, vertical
Downtilt	0 degrees
Power handling	10W (cw)
Connector	Standard N female
Front-to-back ratio	30 dB

Environmental and Mechanical Specifications

Wind Survival (per EIA-222-F at 100’ height)	216 km/hr
Temperature range	-40 to +80 degrees C
Humidity	95% @ 25 degrees C
Lightning protection	DC ground
Size	200 x 200 x 50 mm
Radome color	Black
Radome material	ABS, UV resistant
Weight	0.825 kgw

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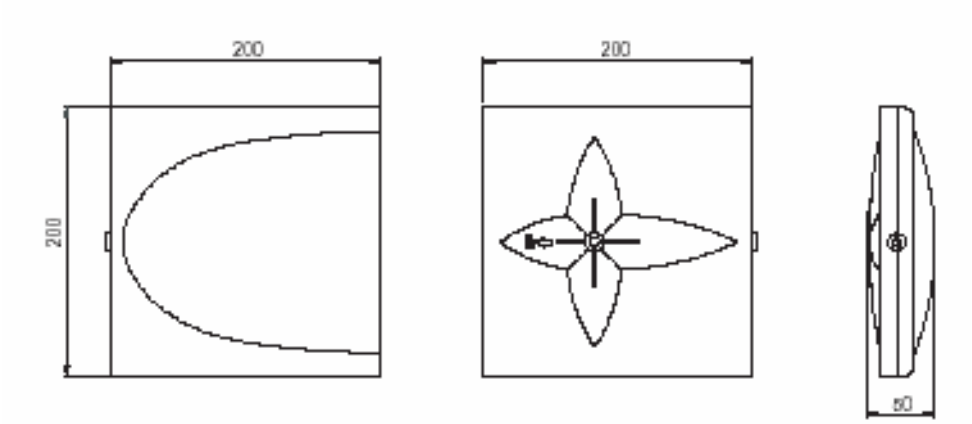
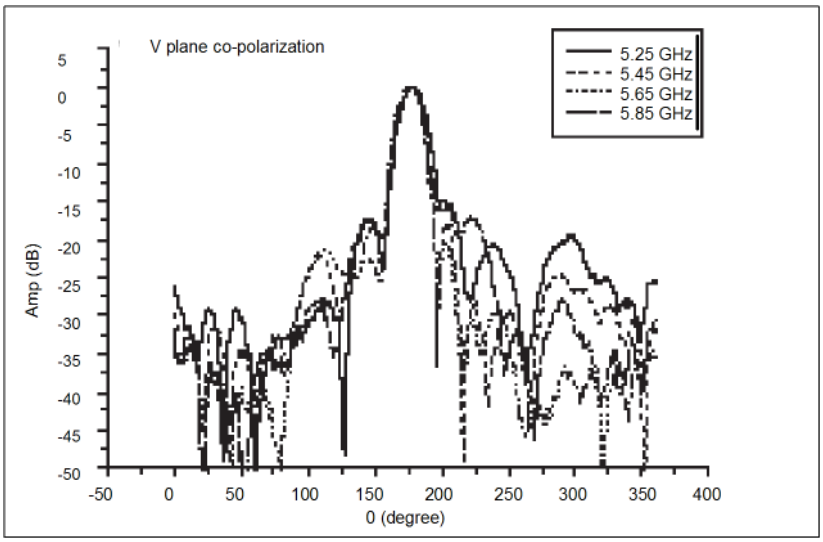
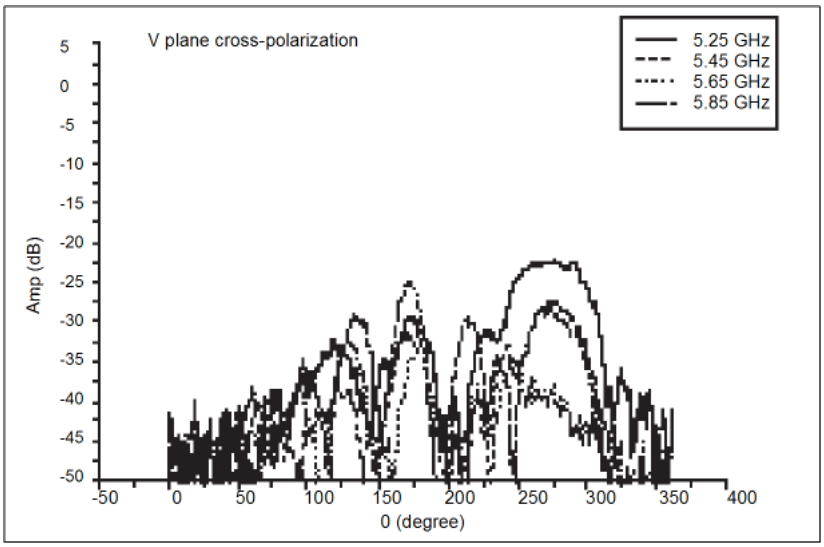
Dimensions



Patterns





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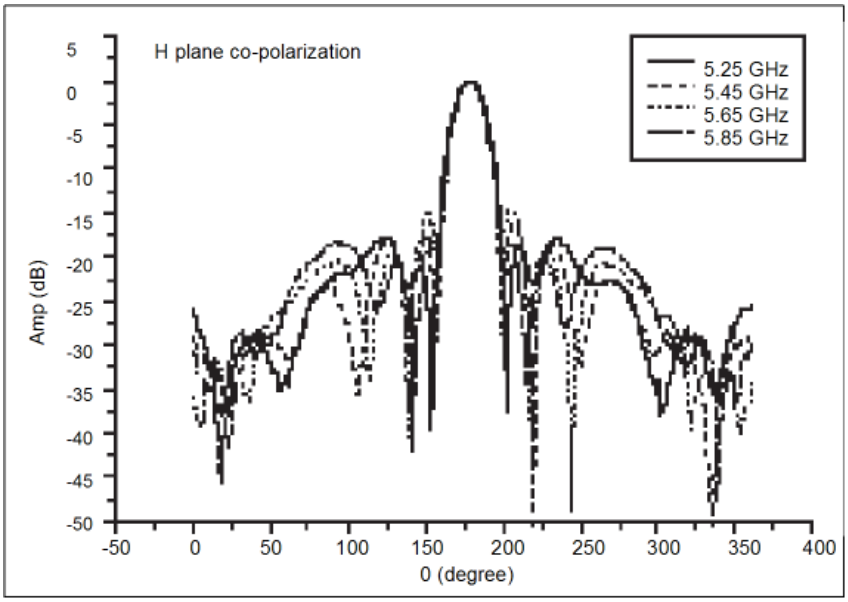

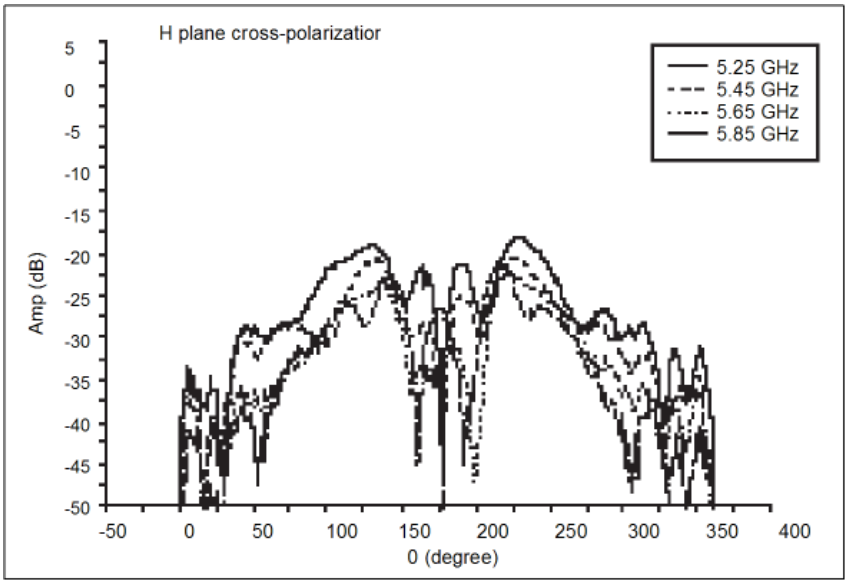

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15 dBi High Gain Directional Panel (Window) Antenna

Pictured: SmartAnt antenna

This window antenna is a high-gain antenna for the 5 GHz frequency band. This antenna is typically used in combination with a Subscriber Unit. The red heat-shrink tube at the antenna connector of this antenna matches the red heat-shrink tube at the MP.11a antenna connector to easily locate and distinguish the 5 GHz antenna components from their look-alikes operating at 2.4 GHz which do not have red heat-shrink tube.

Mounting Instructions

Package contents:

- Antenna
- Extension Cable (3m)
- Mounting Kit
- Quick Installation Guide

Wall Mount for Outdoor/Indoor Application

A. Insert the plastic wall plug (2) into the wall

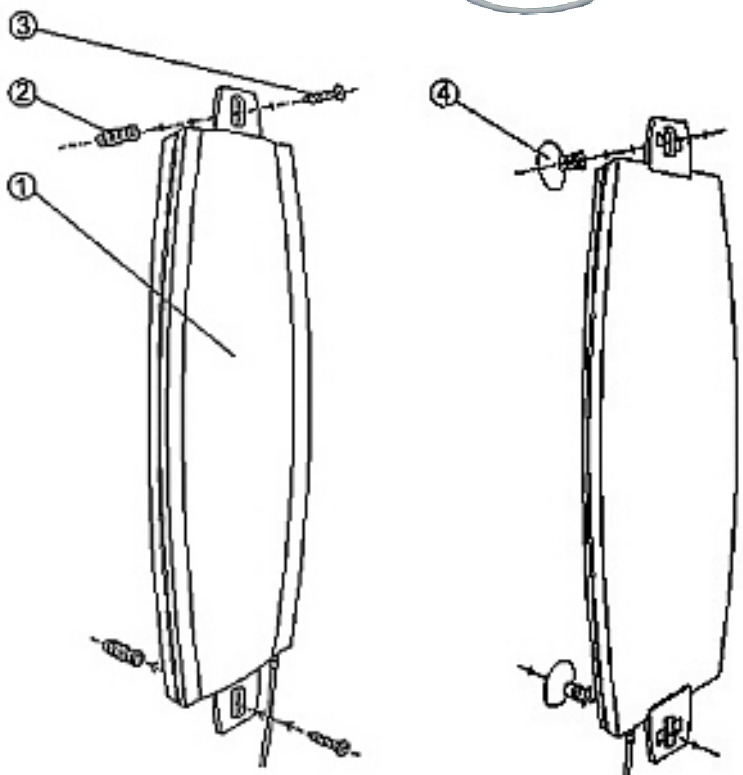
B. Insert the screw (3) into the plastic wall plug through the antenna mounting hole and tighten

Window Suction Mount for Indoor Application

A. Insert the window suction cup through the antenna mounting hole.

B. Turn the suction cup one quarter to lock it into position.

C. Press the window suction cup onto the window glass.



(1) Antenna body
(2) plastic conical anchor
(3) screw
(4) window suction cup

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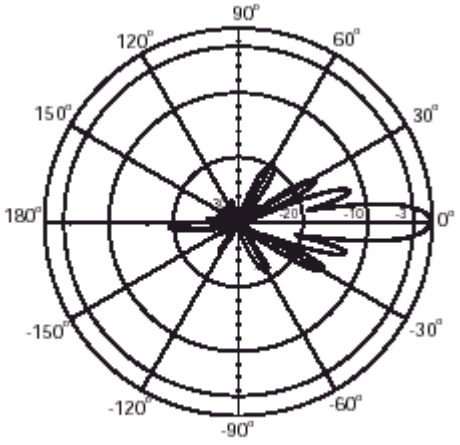
Specifications

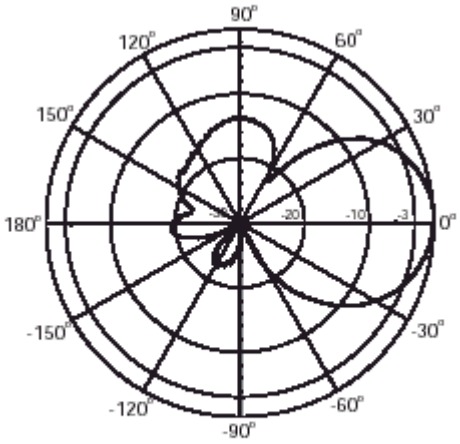
Electrical	
Frequency range	5150 MHz – 5850 MHz
Gain*	15 dBi
VSWR	2.0 : 1 Max.
Polarization	Linear, vertical
HPBW / horizontal	45 degrees
HPBW / vertical	10 degrees
Front to back ratio	18 dB
Downtilt	0 degrees
Power handling	20 W (cw)
Impedance	50 Ohms
Connector	Standard N-female
Cable	ULA-168; 200 cm
Cable loss	2 dB
*exclusive of cable loss	

Environmental and Mechanical	
Survival wind speed	180 km/hr
Temperature	-40º C to +80º C
Humidity	95% @ 25º C
Lightning Protection	DC ground
Radome color	white
Radome material	ABS, UV resistant
Weight	0.6 kgw
Dimensions	330 x 93 x 21 mm

Pattern



Vertical



Horizontal

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23 dBi Broadband Subscriber Panel Antenna MA-WA58-1X

This 5 GHz Broadband Antenna provides a cost effective solution for large scale WLL, WLAN, H-LAN, ISM, UNII, and Point to Multi Point applications.

Additional Features:

- Minimum Gain of 23 dBi over the entire frequency range.
- Light weight and durable construction.
- DC grounded for lightning protection to meet local electrical building codes.

Specifications

Electrical

Frequency range	5.15 - 5.875 GHz
GAIN, typ.	23 dBi
VSWR, max.	1.5:1
Polarization	Linear Vertical
3 dB Beam Width - Az./El., typ.	10.5 degrees
Cross Polarization, min	24 dB
Power Handling	10 Watts
Input Impedance	50 Ohms
Front to Back Ratio, min.	35 dB

Mechanical and Environmental

Dimensions (LxWxD) 305x305x15 mm (DIAMOND Shape)

Base Plate Aluminum, Coated

Radome Plastic, UV protected

Temperature -40 degrees C up to +75 degrees C

Input/RF Interface N-Type (others available)

Standard Compliance

ETSI EN 302 085 V1.1.2 (2001-02) Range 1, TS 1, 2, 3, 4, 5

Specifications subject to change without notice

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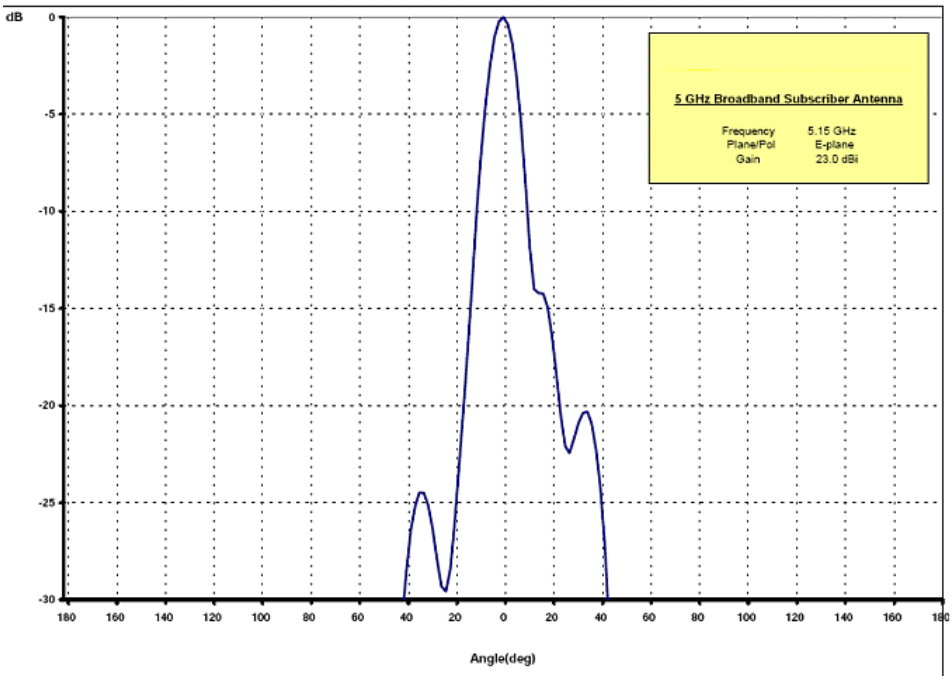
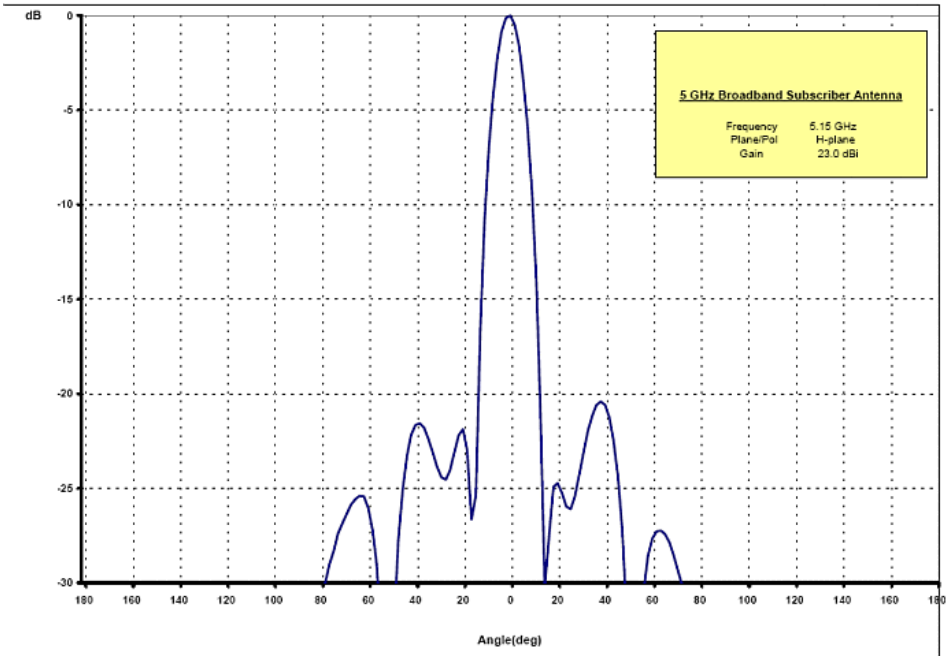
Patterns





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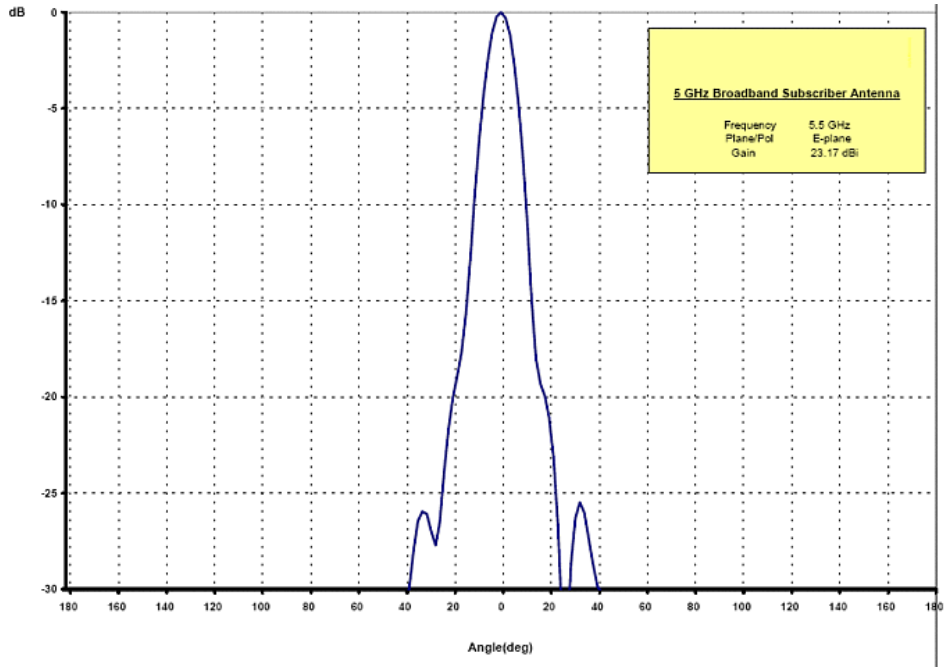

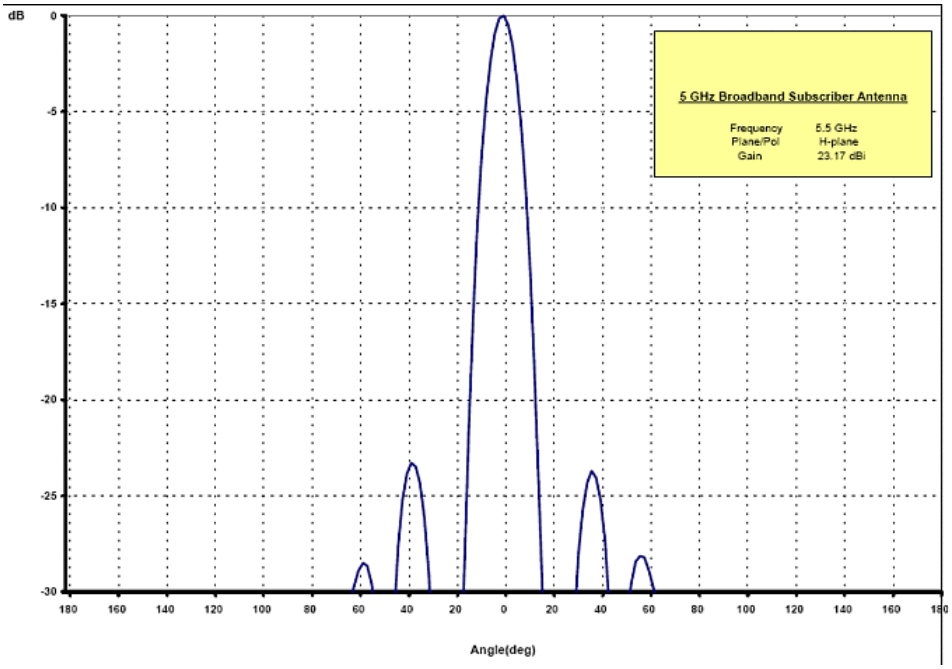

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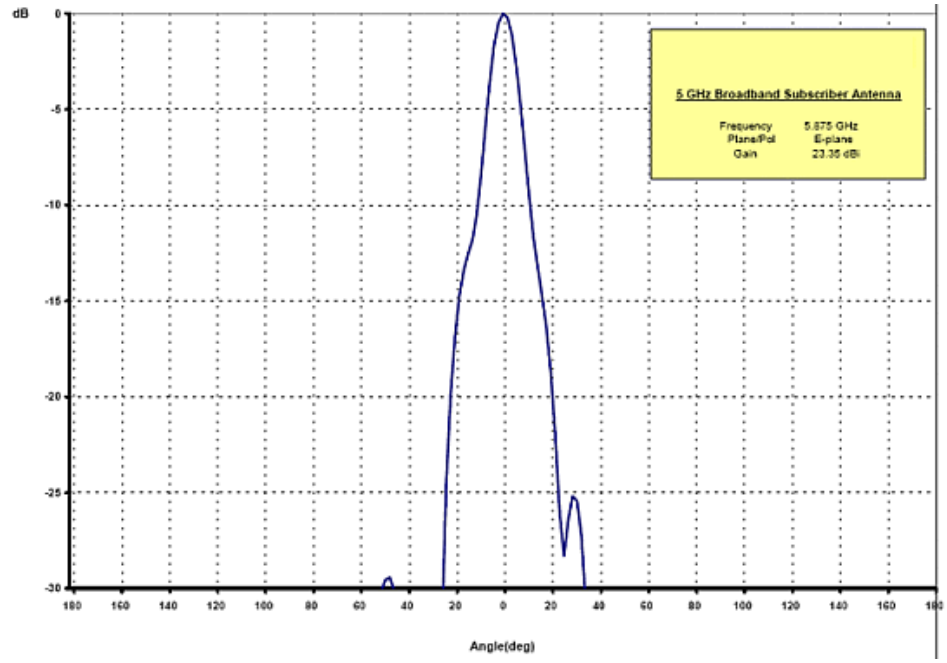

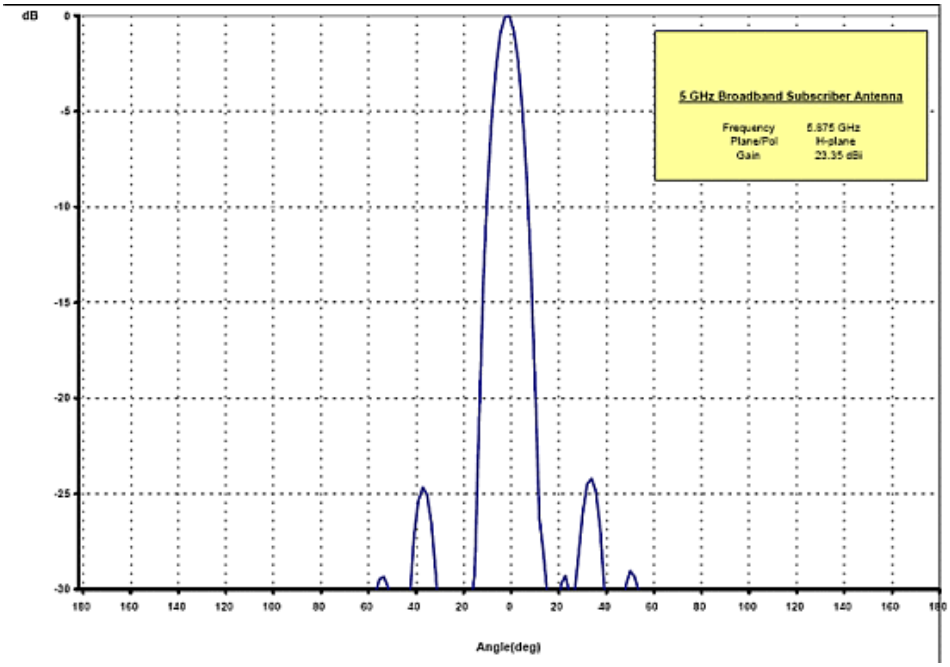

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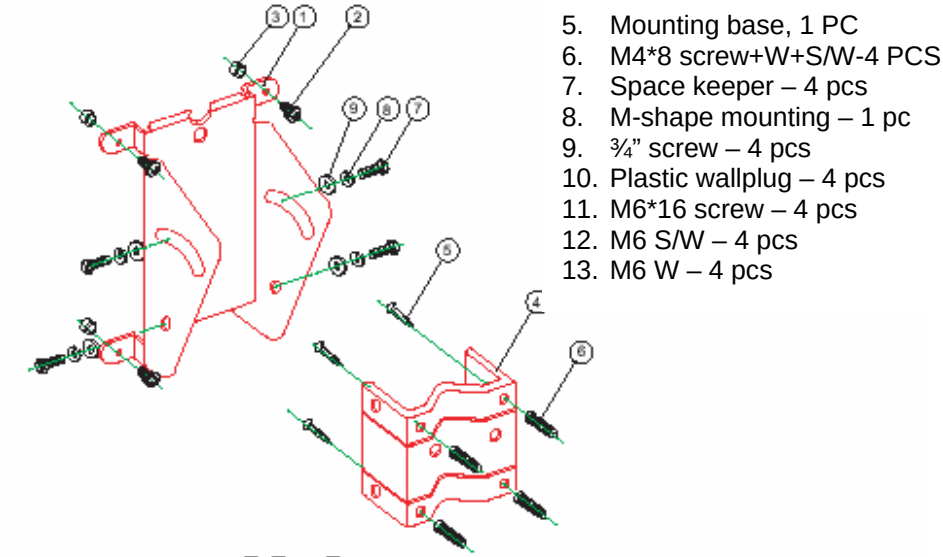
23 dBi High Gain Directional Panel Antenna for 5.8 GHz (5054-PA-23)

Pictured: SmartAnt antenna

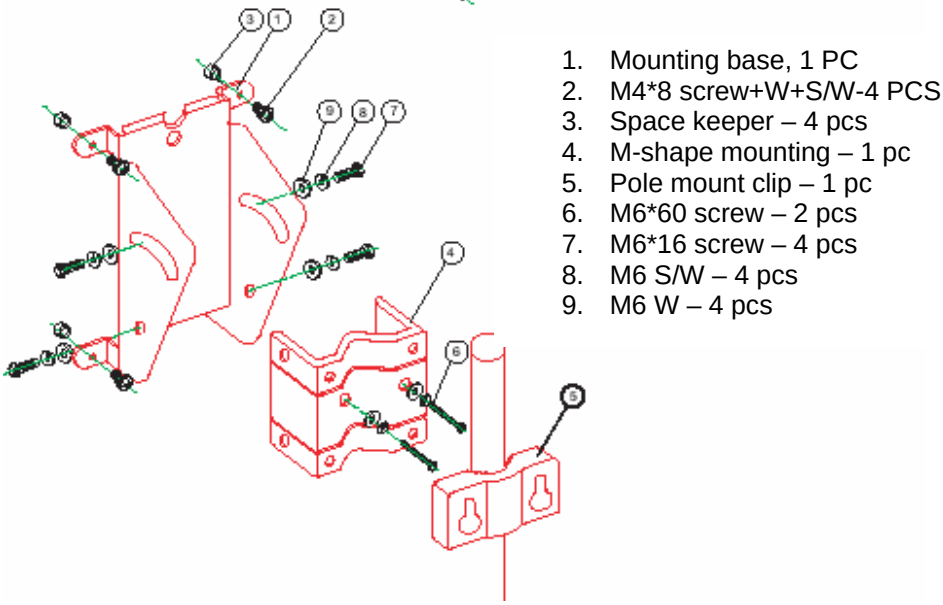
Package Contents

- Antenna
- Extension Cable (50cm)
- Mounting Kit
- Surge Arrestor
- Water-proof tape
- Quick Installation Guide

Mounting



5. Mounting base, 1 PC
6. M4*8 screw+W+S/W-4 PCS
7. Space keeper – 4 pcs
8. M-shape mounting – 1 pc
9. ¾” screw – 4 pcs
10. Plastic wallplug – 4 pcs
11. M6*16 screw – 4 pcs
12. M6 S/W – 4 pcs
13. M6 W – 4 pcs



1. Mounting base, 1 PC
2. M4*8 screw+W+S/W-4 PCS
3. Space keeper – 4 pcs
4. M-shape mounting – 1 pc
5. Pole mount clip – 1 pc
6. M6*60 screw – 2 pcs
7. M6*16 screw – 4 pcs
8. M6 S/W – 4 pcs
9. M6 W – 4 pcs

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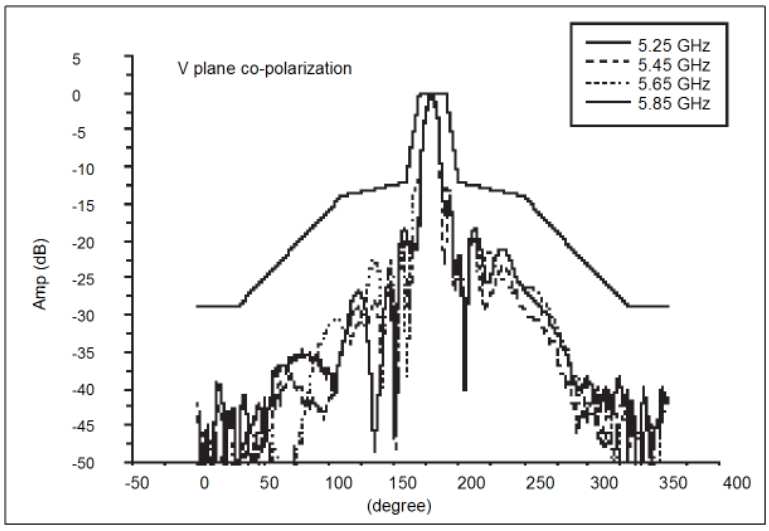
Electrical Specifications

Frequency Range	5725 - 5875 MHz
Nominal Impedance	50 ohms
Gain	23 dBi
Front-to-Back Ratio	40 dB
HPBW/vertical	9 degrees
HPBW/horizontal	9 degrees
Cross Polarization	25 dB
Power handling	20 W (cw)
Connector	Standard N female
VSWR	1.5: 1 maximum

Environmental and Mechanical Specifications

Wind Survival (per EIA-222-F at 100' height)	216 km/hr
Temperature range	-40 to +80 degrees C
Humidity	95% @ 25 degrees C
Lightning protection	DC ground
Size	360 x 360 x 16 mm
Weight	1.6 kgw
Radome material	ABS, UV resistant
Radome color	white

Patterns



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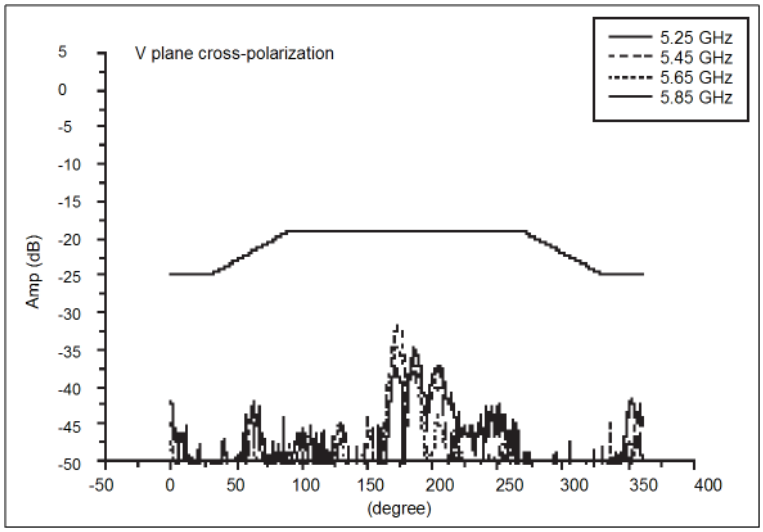

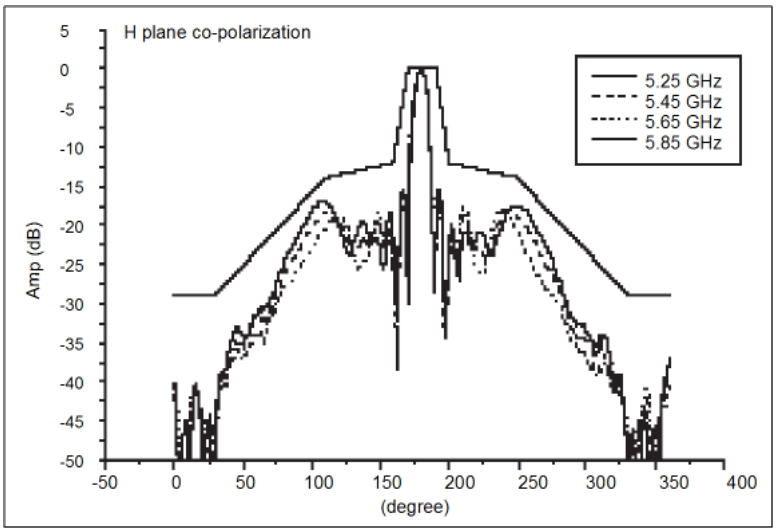

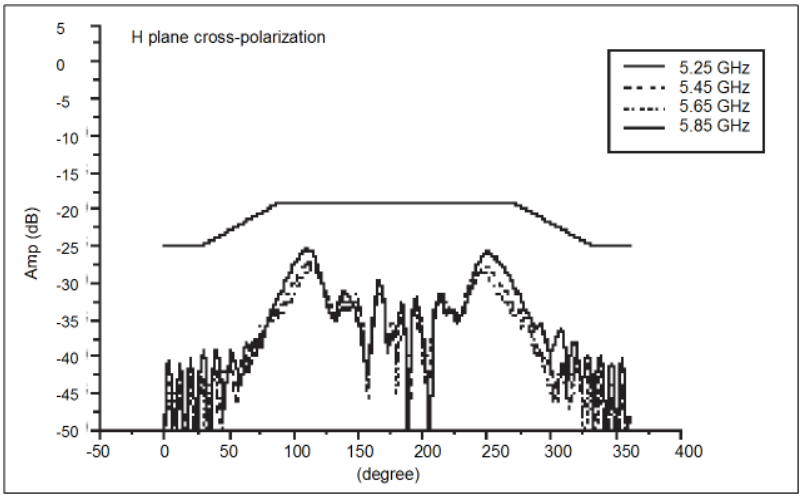

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Other Recommended Panel Antennas

Type	Manufacturer	Model Number	Frequency Range	Mid-Band Gain
Panel	SmartAnt	R0320-056	5.15 – 5.875	8
	Gabriel	DFPS.5-52	5.25 – 5.85	18
	MTI	MT-485001/N	5.15 – 5.875	18
	MTI	MT-485028/N	5.15 – 5.875	22
	MTI	MT-486004/N	5.15 – 5.875	26
	Mars	MA-WA57-3X	5.15 – 5.875	17.5
	Radiowaves	FP .5-5-18	5.25 – 5.85	18
1-Foot Flat Panel	Gabriel	DFPD1-52	5.25 – 5.85	23.5
	Andrew	FPA5250D12-N	5.25 – 5.85	23.6
	MTI	485002/N	5.15 – 5.875	23
	Mars	MA-WA58-1X	5.15 – 5.875	23
	RadioWaves	FP1 5-24	5.25 – 5.85	24
2-Foot Flat Panel	MTI	MT-486001/N	5.15 – 5.875	28
	Gabriel	DFPD2-52	5.25 – 5.85	28
	Andrew	FPA5250D24-N	5.25 – 5.85	28.2
	RSI	A57A24-U	5.725 – 5.85	26.5
	RadioWaves	FP2 5-28	5.25 – 5.85	28

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PARABOLIC ANTENNAS

Recommended parabolic antennas for 5 GHz are listed in the following table.

Type	Manufacturer	Model Number	Frequency Range	Mid-Band Gain
2-Foot Parabolic	Gabriel	SSP2-52B	5.25 – 5.85	28.5
	Gabriel	SSD2-52A	5.25 – 5.85	28.4
	Gabriel	HSSP2-52	5.25 – 5.85	28.1
	Radio Waves	SP2-5.2	5.25 – 5.85	28.3
	Radio Waves	SPD2-5.2	5.25 – 5.85	28.1
	Andrew	P2F-52	5.25 – 5.85	29.4
	Andrew	PX2F-52	5.25 – 5.85	29.4
	RSI	P-57C24		29
3-Foot Parabolic	Radio Waves	SP3-5.2	5.25 – 5.85	31.4
	Radio Waves	SPD3-5.2	5.25 – 5.85	31.1
	Andrew	P3F-52	5.25 – 5.85	33.4
	Andrew	PX3F-52	5.25 – 5.85	33.4

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Recommended 2.4 GHz Antennas

OMNI ANTENNAS

7 dBi Omni-Directional Base Unit Antenna

General Description

The Tsunami 7 dBi Omni-Directional Base Unit Antenna is a broadband antenna for the 2.4 GHz frequency band featuring an omni-directional pattern with a nominal gain of 7 dBi.

The pole-type antenna is enclosed in a weatherproof protective covering (“radome”). This vertically polarized antenna can be mounted to an antenna mast with an outside diameter of up to 65 mm (2.5 in).

For detailed specifications see the table in this appendix.

DANGER!	***When selecting an antenna location, ensure that the general precautions are met to avoid possible contact with electrical power lines. See the National Electrical Code for proper grounding of the antenna mast***

Mounting the Omni-directional Antenna

You can mount the 7 dBi antenna to a mast only. This antenna uses vertical polarization, which is the most common type of polarization for omni-directional antennas.

Mounting to a Mast

To mount the antenna to a mast proceed as follows:

1. Verify that you have all the items listed below:
   - The 7 dBi Pole Antenna
   - The O-shaped metal bracket
   - The U-bolt, nuts and lock washers
   - A small wrench to tighten the nuts
2. Position the bracket (item d in the following figure) to the top of the antenna mast (item b).
3. Place the U-bolt (item c) around the antenna mast, and slide its ends through the corresponding holes of the bracket.
4. Use the lock-washers (item e) and nuts (item f) to secure the bracket to the mast. Use a wrench to tighten the nuts.
5. Next, feed the antenna cable of the 7 dBi Omni-Directional Base Unit Antenna (item a) through the hole of the mounting bracket.
6. As shown in the following figure, slide the antenna down until its metal base is enclosed by the mounting bracket.

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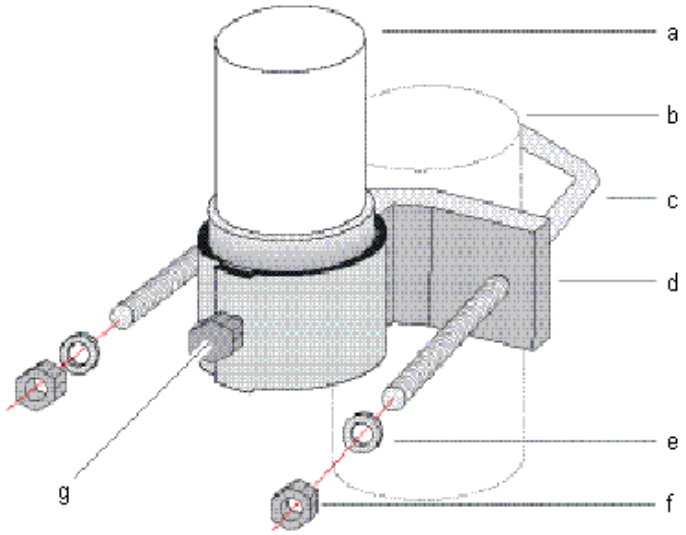

Mounting the 7 dBi Antenna to a Mast

7. Use a wrench to tighten the bracket bolt (item g) to fix the antenna into its position.

CAUTION! Avoid over-tightening the hose-clip nut to avoid damage to the clip and your antenna.

Technical Specifications

Mechanical	
Size	43.2 cm (17 in)
Mounting method	Clamps to vertical mast with outside diameter between 35 mm (1.4 in) and 65 mm (2.55 in)
Connector[1]	Standard N (female)
Electrical	
Frequency Range	2.400 – 2.484 GHz
VSWR	Less than 2:1 nominal
Nominal Impedance	50 ohms
Gain	7 dBi
Polarization	Linear vertical
Antenna Environment	
Operating temperature	-40 degrees C (-40 degrees F) to +60 degrees C (+140 degrees F)
Wind/survival	At least 200 km/h (124 mph)[2]

[1]See also “Selecting the Correct Connector Type”.
[2]At least 100 km/h (62 mph) with 1.25 cm (0.5 in) ice.

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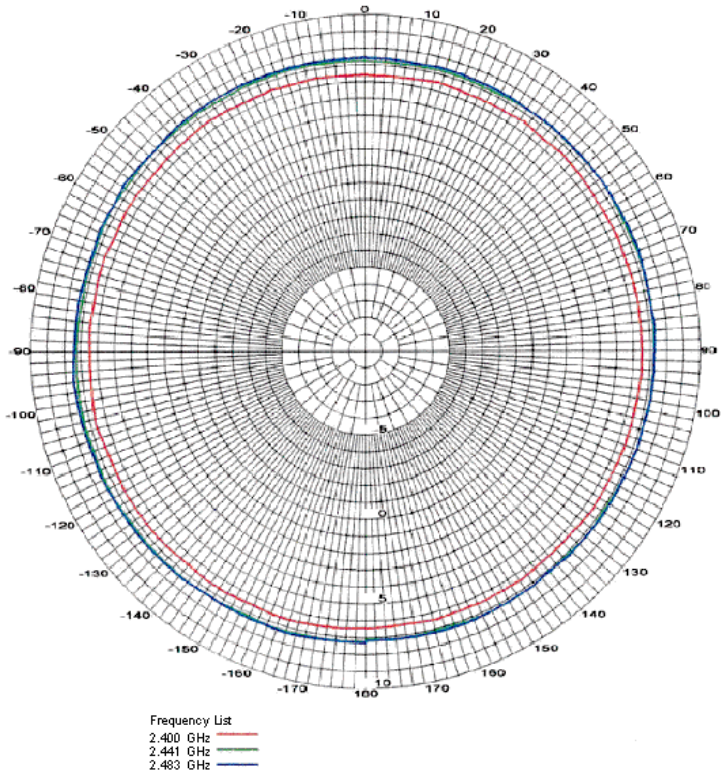
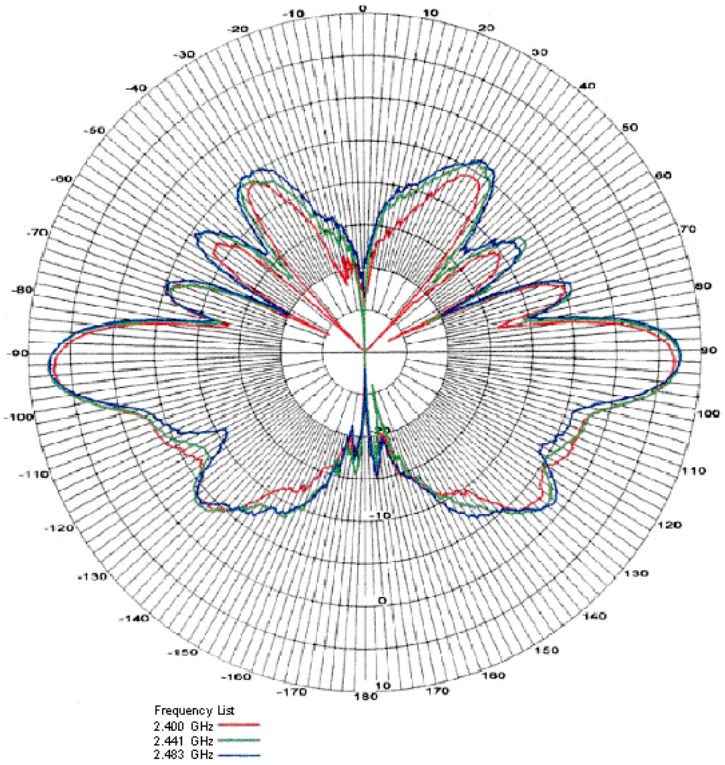
Pattern



Azimuth Plane (Horizontal), 7 dBi Omni-Directional Base Unit Antenna



Elevation Plane (Vertical), 7 dBi Omni-Directional Base Unit Antenna

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10 dBi Omni-Directional Base Unit Antenna

General Description

The Tsunami 10 dBi Omni-Directional Base Unit Antenna is a broadband antenna for the 2.4 GHz frequency band featuring an omni-directional pattern with a nominal gain of 10 dBi.

This antenna is typically used in combination with a Base Unit.

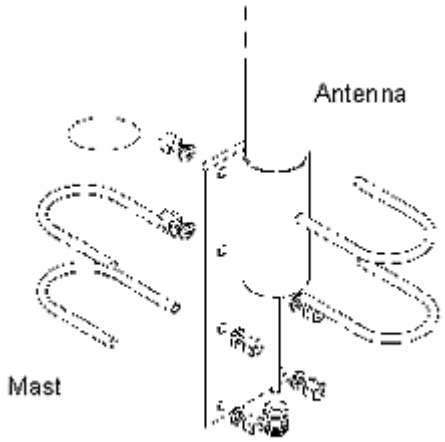
The pole-type antenna is enclosed in a weatherproof protective covering (“radome”). This vertically polarized antenna can be mounted to an antenna mast with an outside diameter of up to 51 mm (2.0 in).

For detailed specifications see the table in this appendix.

DANGER!	***When selecting an antenna location, ensure that the general precautions are met to avoid possible contact with electrical power lines. See the National Electrical Code for proper grounding of the antenna mast***

Mounting Instructions

1. Attach the ferrule of the antenna to the mounting bracket with two U-bolts as shown in the following figure.
2. Next use the remaining two U-bolts to attach the mounting bracket to the mast. Tighten nuts to 9 Nm (7 ft-lbs).



Mounting the 10 dBi Antenna

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Technical Specifications

Mechanical	
Size	91.4 cm (36 in)
Mounting Method	Clamps to vertical mast with outside diameter between 35 mm (1.4 in) and 51 mm (2.0 in)
Connector[1]	Standard N (female)
Cable	
Type	RG-303, 50 ohms low-loss coaxial
Length	25 cm (10 in)
Color	Tan
Electrical	
Frequency Range	2..4 GHz
VSWR	Less than 2:1 nominal
Nominal Impedance	50 ohms
Gain	10 dBi
Polarization	Linear vertical
Antenna Environment	
Operating Temperature	-40 degrees C (-40 degrees F) to +60 degrees C (+140 degrees F)
Wind/survival (mph)	At least 240 km/h (150 mph)[2]

[1]See also “Selecting the Correct Connector Type”.

[2]At least 200 km/h (124 mph) with 1.25 cm (0.5 in) ice.

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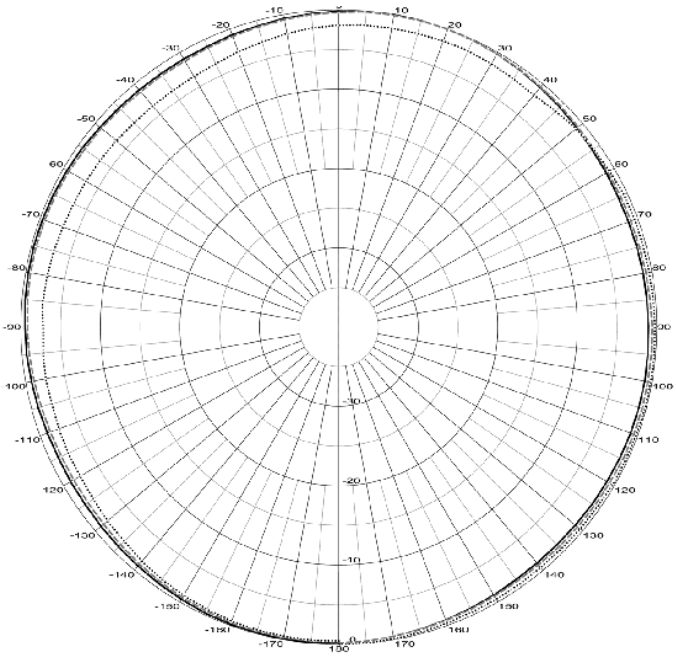
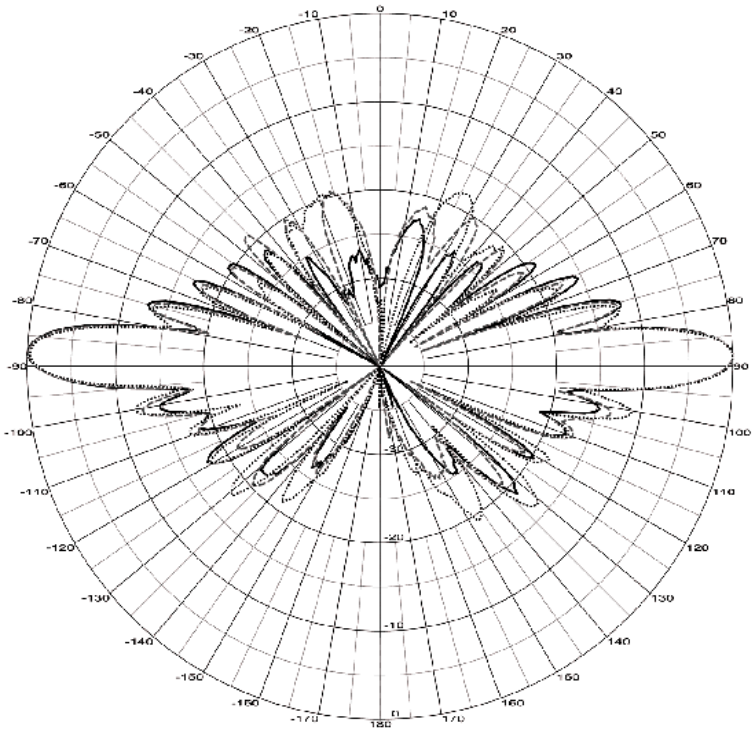
Pattern



Azimuth Plane (Horizontal), 10 dBi Omni-Directional Base Unit Antenr



Elevation Plane (Vertical), 10 dBi Omni-Directional Base Unit Antenna

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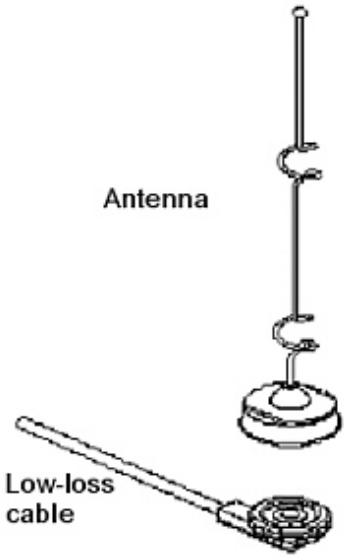
5 dBi Omni-Directional Antenna

General Description

The Tsunami 5 dBi Omni-Directional Antenna is designed for use in rugged environments. The antenna operates in the frequency range from 1500 to 2400 MHz. It is supplied with a special proprietary FCC plug and a low-loss cable.

This antenna uses vertical polarization, which is the most common type of polarization for omni-directional antennas.



Technical Specifications

Mechanical	
Size	24 cm (9.5 in)
Mounting Method	Through a 19 mm (0.75 in) M-type hole using a mounting plate.
Connector	Standard N female[1] snap-on with 100% captive pin
Cable	
Type	50 ohms low-loss cable
Length	2.5 m (8 ft.)
Color	White
Electrical	
Frequency Range	2.400 to 2.4835 GHz
VSWR	Less than 2:1 nominal
Nominal Impedance	50 ohms
Gain	5 dBi
Polarization	Linear vertical
Antenna Environment	
Operating Temperature	-40 degrees C (-40 degrees F) to +60 degrees C (+140 degrees F)
Wind/survival	At least 200 km/h (124 mph)[2]

[1]See also “Selecting the Correct Connector Type” in the Antenna Installation Guide.
[2]At least 100 km/h (62 mph) with 1.25 cm (0.5 in) ice.

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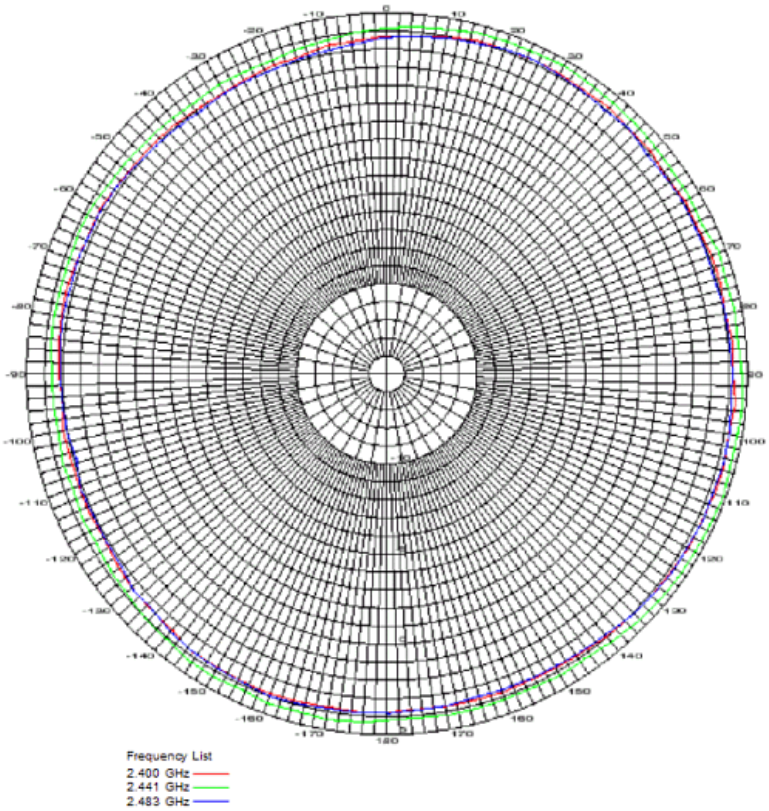
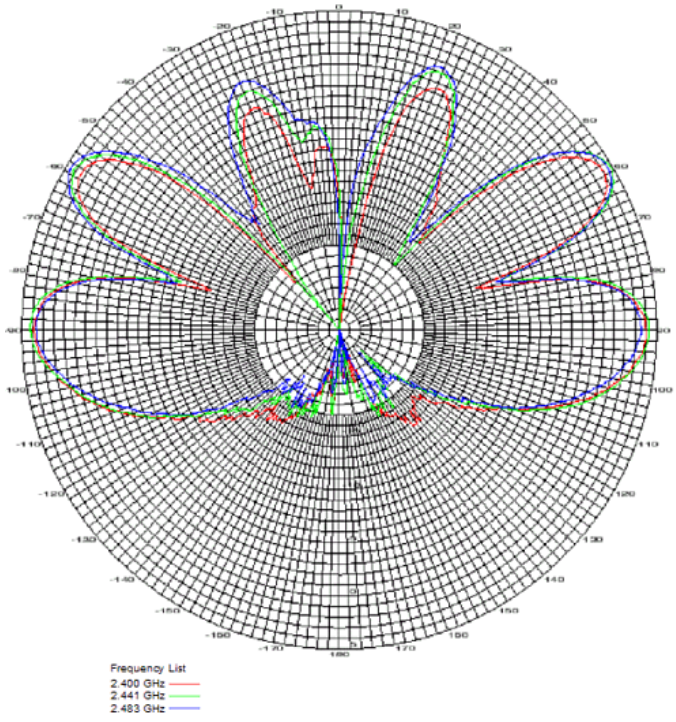
Pattern



Azimuth Plane (Horizontal), 5 dBi Omni-Directional Antenna



Elevation Plane (Vertical), 5 dBi Omni-Directional Antenna

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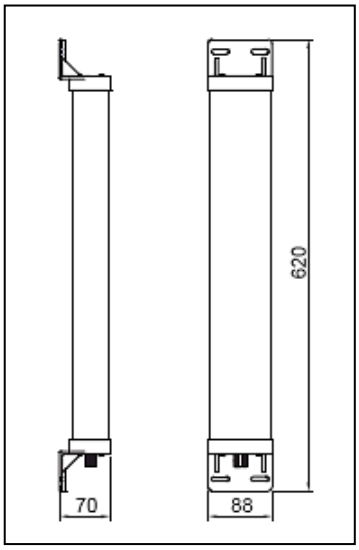
SECTOR ANTENNAS

14 dBi 65-Degree Sector Antenna for 2.4 GHz PRX04-053970

Electrical Specification

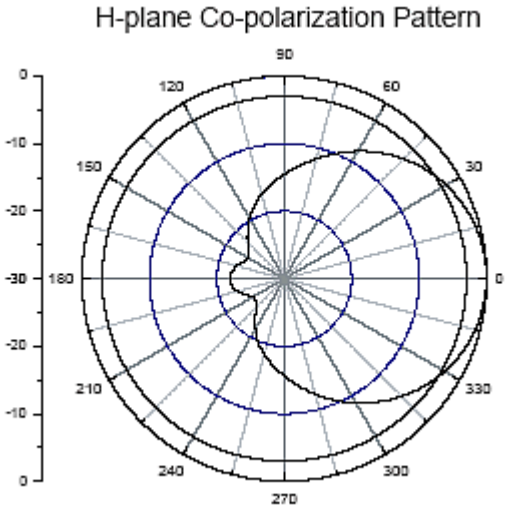
Frequency range	2400 MHz - 2500 MHz
Gain	14 dBi
VSWR	1.8 : 1 Max.
Polarization	Linear, vertical
HPBW / horizontal	65 degrees
HPBW / vertical	13
Front to back ratio	25 dB
Downtilt	0 degrees
Power handling	5 W (cw)
Impedance	50 ohms
Connector	N Jack

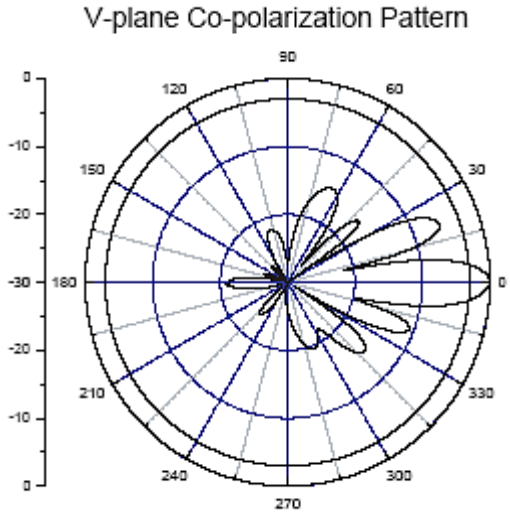


Evironmental & Mechanical Characteristics

Survival wind speed	180 km/hr
Temperature	- 40 deg. C to +80 deg. C
Humidity	100% @ 25 degrees C
Radome color	Gray-white
Radome material	ABS, UV resistant
Weight	5.55 kg
Dimensions	600 x 88 x 70 mm

Pattern





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12 dBi Directional Wide Angle Antenna

General Description

The Tsunami 12 dBi Directional Wide Angle Antenna is for the 2.4 GHz frequency band is a perfect match between the features of the:

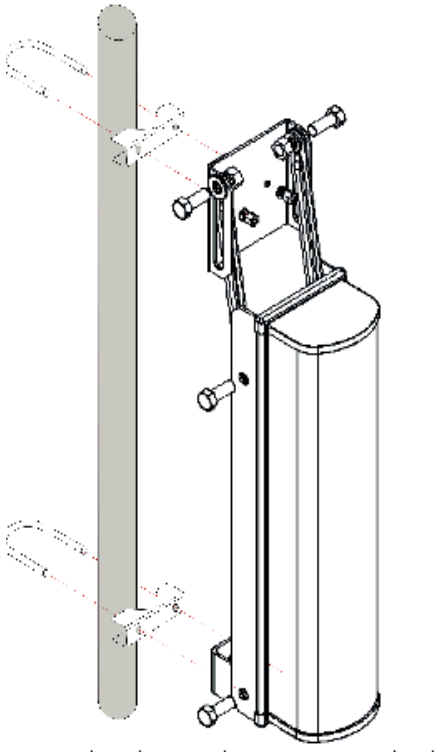
- Directional antennas
- Omni-directional antennas

Typically used in combination with a Base stationBase Unit, this antenna can be mounted to an antenna mast with an outside diameter of up to 51 mm (2.0 in).

Mounting Instructions

DANGER!	***When selecting an antenna location, ensure that the general precautions are met to avoid possible contact with electrical power lines. See the National Electrical Code for proper grounding of the antenna mast.***

1. Attach the U-bolts, tube mounting bracket, upper mounting bracket, and lower mounting bracket to the mast and spaced as shown in the following figure.



Mounting the 12 dBi Wide Angle Antenna

2. Assemble the angle adjustment brackets to the upper mounting bracket with 1/2 inch bolts, lock washers, flat washers and nuts.
3. Next assemble the angle adjustment brackets and lower mounting brackets to the antenna base plate with 1/2 inch bolts, lock washers, and nuts.This adjustment is for 0 degree mounting. To adjust from 0 to -20 degrees, loosen the hardware at both ends of the angle adjustment bracket and slide it in the slot to the preferred angle.
4. Tighten hardware securely. The U-bolts should be tightened to 9 Nm (7 ft-lbs).

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Technical Specifications

Mechanical	
Size (LxWxD)	181 x 53.7 x 76 cm (21.1 x 7.1 x 3.0 in)
Mounting Method	Clamps to vertical mast with outside diameter between 35 mm (1.4 in) and 51 mm (2.0 in)
Connector[1]	Standard N (female)
Electrical	
Frequency Range	2.400 – 2.484 GHz
VSWR	Less than 2:1 nominal
Nominal Impedance	50 ohms
Gain	12 dBi
Polarization	Linear vertical
Half-Power Beamwidth (at vertical polarization)	
Elevation Plane (vertical)	13 degrees
Azimuth Plane (horizontal)	125 degrees
Antenna Environment	
Operating Temperature	-40 degrees C (-40 degrees F) to +60 degrees C (+140 degrees F)
Wind/survival (mph)	At least 200 km/h (124 mph)[2]

[1]See also “Selecting the Correct Connector Type”.

[2]At least 100 km/h (62 mph) with 1.25 cm (0.5 in) ice.

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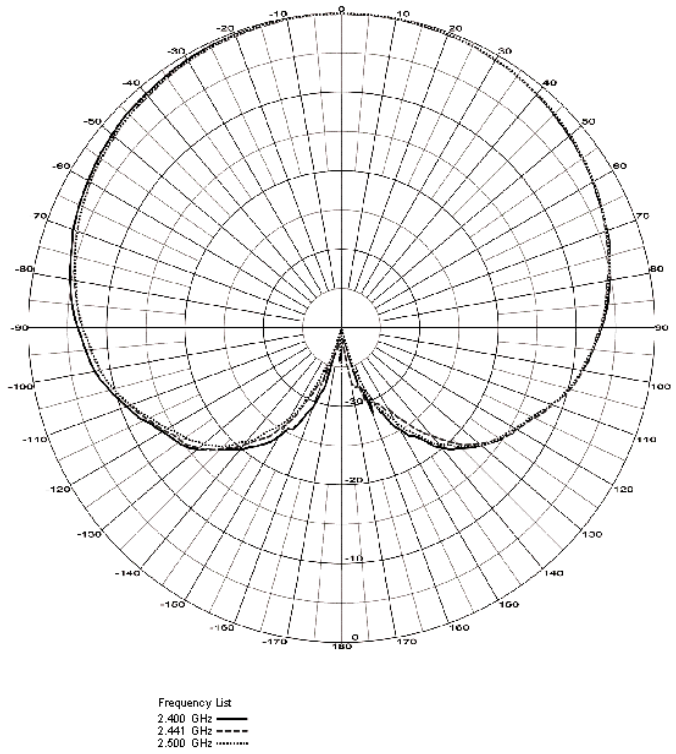
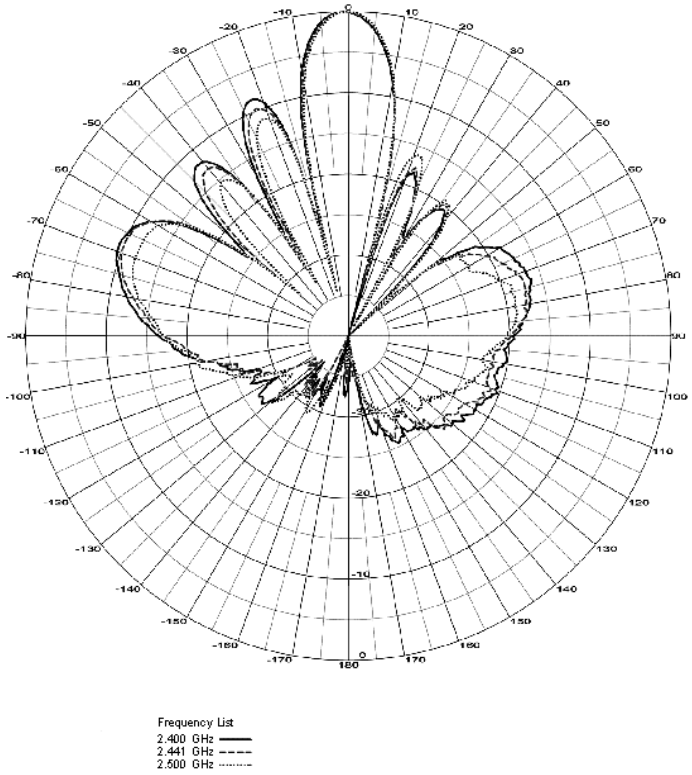
Pattern



Azimuth Plane (Horizontal), 12 dBi Directional Wide Angle Antenna



Elevation Plane (Vertical), 12 dBi Directional Wide Angle Antenna

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14 dBi Directional Antenna

General Description

14 dBi Directional Antenna is a high-gain antenna for the 2.4 GHz frequency band. This antenna is typically used in combination with a Subscriber Unit.

The 14 dBi Directional Antenna consists of a totally enclosed 16 element Yagi antenna that has been designed for point-to-point communications. It has a typical VSWR of 1.5:1 and is less than 2:1 over the entire frequency band. The gain is 14 dBi and the half-power beamwidth is 30 degrees. This antenna is normally mounted on a mast and is vertically polarized.

Contents of the Antenna Box

- One encapsulated antenna
- Metal backing plate for the antenna
- 2 U-bolts, with 2 bolt heads (for mast mounting)
- 4 flat washers, and 4 nuts (to attach the antenna to the U-bolts or screws)

Mounting the Directional Antenna

You can mount the Tsunami 14 dBi Directional Antenna to a mast or a flat vertical surface, such as a wall.

In most cases, mounting the antenna to a mast allows for more flexibility in adjusting the height and direction of the antenna to aim it at the opposite end of the wireless link.

DANGER!	***When selecting an antenna location, ensure that the general precautions are met to avoid possible contact with electrical power lines. See the National Electrical Code for proper grounding of the antenna mast***

Mounting to a Mast

To mount the antenna to a mast proceed as follows:

1. Verify if you have all the items listed below:
   - The Tsunami 2.4 GHz antenna
   - The 2 U-bolts and bolt heads provided
   - The 4 flat washers and 4 nuts provided
   - A socket wrench to tighten the nuts
2. Note the arrows on the mounting plate; mount the antenna with the arrows pointing up.
3. Attach the antenna to the mast as depicted in the following figure, using the U-bolts and bolt heads, the Metal Backing Plate and nuts.

CAUTION!	***Always place flat washers between heads (or nuts) and the plastic mounting plate. Avoid over-tightening the nuts and screws to prevent damage to the mounting plate.***

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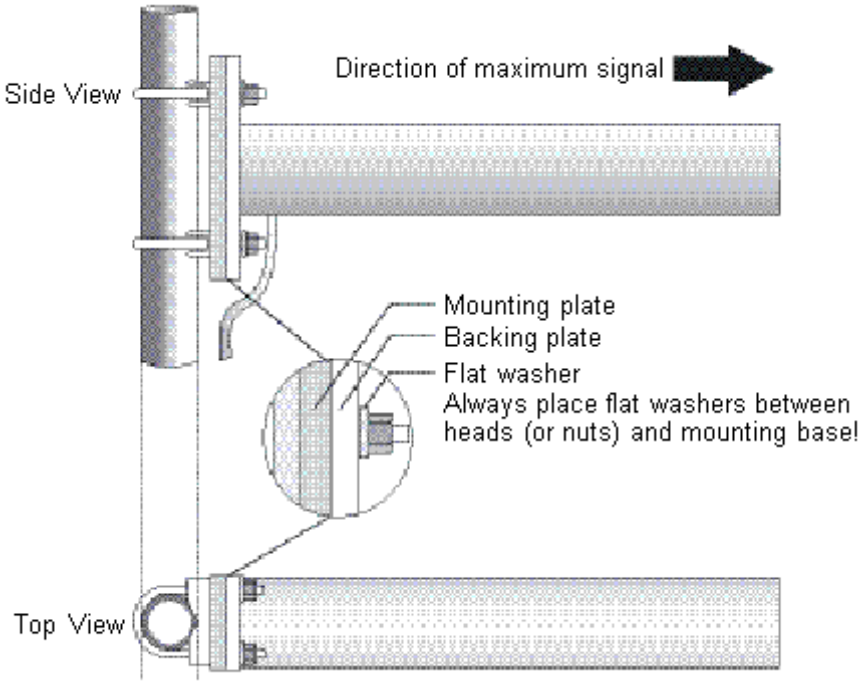

Mounting 14 dBi Antenna to a Mast

Mounting on a Flat Surface

For mounting the antenna to a flat vertical surface, you must provide a smooth surface for the antenna mount. On wall surfaces such as brick, block or stucco, use an intermediate surface such as a plywood board or metal plate between the wall and antenna. The intermediate surface must be of sufficient strength to prevent distortion of the antenna base when the mounting hardware is tightened.

To mount the antenna proceed as follows:

1. Verify whether you have all the following items:

   The 2.4 GHz antenna
   (optional) an intermediate plate
   4 plugs and screws
   4 flat washers
   An electric drill
   A screwdriver to tighten the screws

2. Note the arrows on the mounting plate; mount the antenna with the arrows pointing up.

3. Attach the antenna using the intermediate plate, metal backing plate and flat washers.

CAUTION! Always use flat washers between the screws and the plastic mounting plate. Avoid over-tightening nuts and screws to prevent damage to the mounting plate.

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Technical Specifications

Mechanical	
Size	44.7 cm (18 in)
Mounting method	Vertical or horizontal mast with an outside diameter between 28 mm (1.102 in) and 41 mm (1.625 in) using U-bolts. Wall using plugs and screws
Connector[1]	Standard N (female)
Cable	
Type	RG58A/U, 50 ohms low-loss coaxial
Color	White
Electrical	
Frequency Range	2.4 GHz
VSWR	Less than 2:1, 1.5:1 nominal
Nominal Impedance	50 ohms
Gain	14 dBi
Front-to-back ratio	Greater than 20 dB
Half-Power Beamwidth	
Elevation Plane (vertical)	30.8 degrees
Azimuth Plane (horizontal)	31.4 degrees
Polarization	Linear vertical (standard mounting) Horizontal (when mounted differently; see “Mounting the Directional Antenna” on page 45).
Antenna Environment	
Operating temperature	-40 degrees C (-40 degrees F) to +60 degrees C (+140 degrees F)
Wind/survival	At least 200 km/h (124 mph)[2]

[1]See also “Selecting the Correct Connector Type”.

[2]At least 100 km/h (62 mph) with 1.25 cm (0.5 in) ice.

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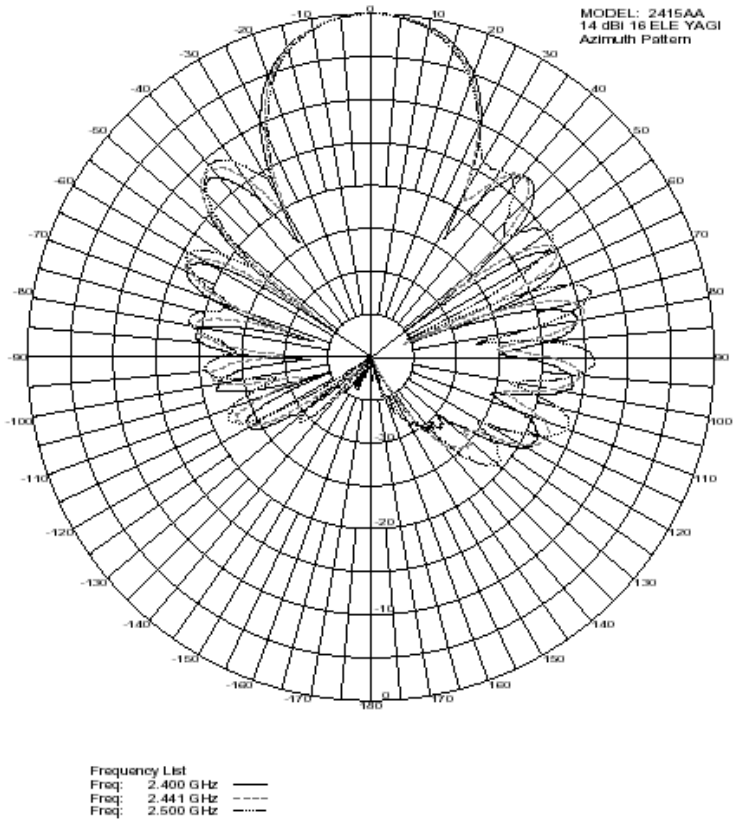
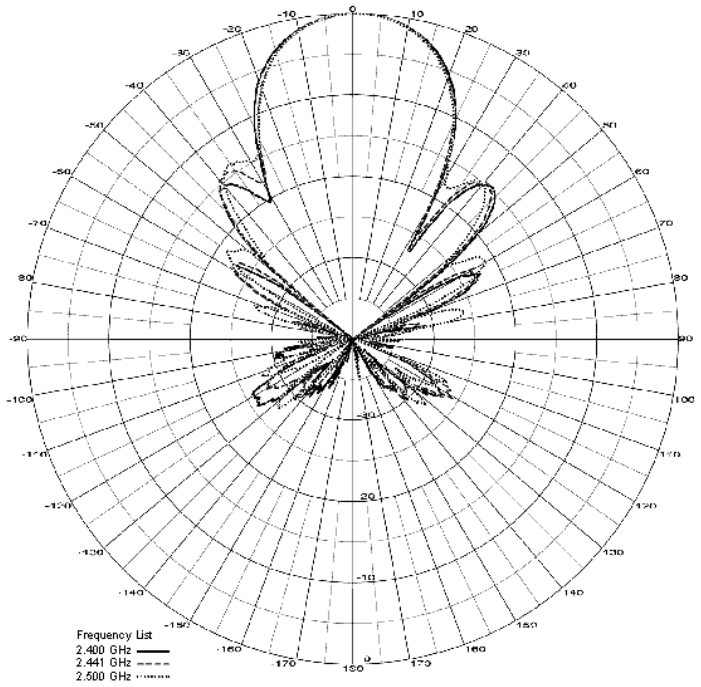
Pattern



Azimuth Plane (Horizontal), 14 dBi Directional Antenna



Elevation Plane (Vertical), 14 dBi Directional Antenna

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PANEL ANTENNAS

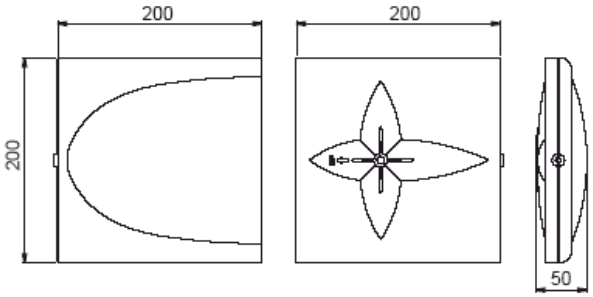
- 14 dBi Directional Panel Antenna for 2.4 GHz PRX04-050250
- High Gain Panel Directional Antenna for 2.4 GHz

14 dBi Directional Panel Antenna for 2.4 GHz PRX04-050250

Electrical Specification

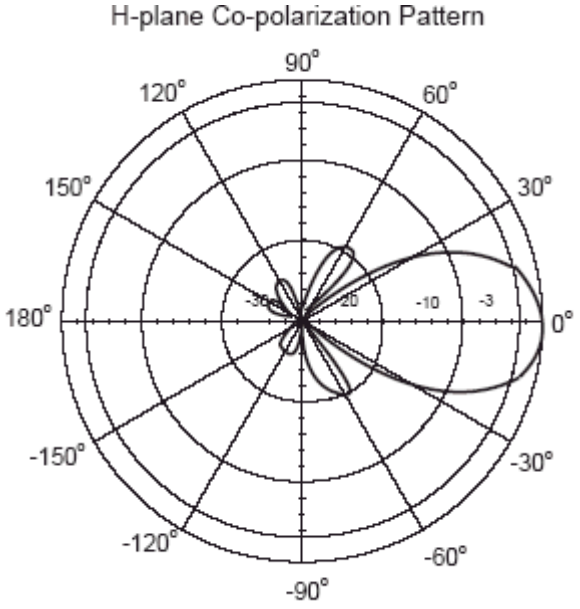
Frequency range	2400 MHz - 2500 MHz
Gain	14 dBi
VSWR	1.5 : 1 Max.
Polarization	Linear, vertical
HPBW / horizontal	30 degrees
HPBW / vertical	30 degrees
Front to back ratio	15 dB
Downtilt	0 degrees
Power handling	10W (cw)
Impedance	50 Ohms
Connector	N female

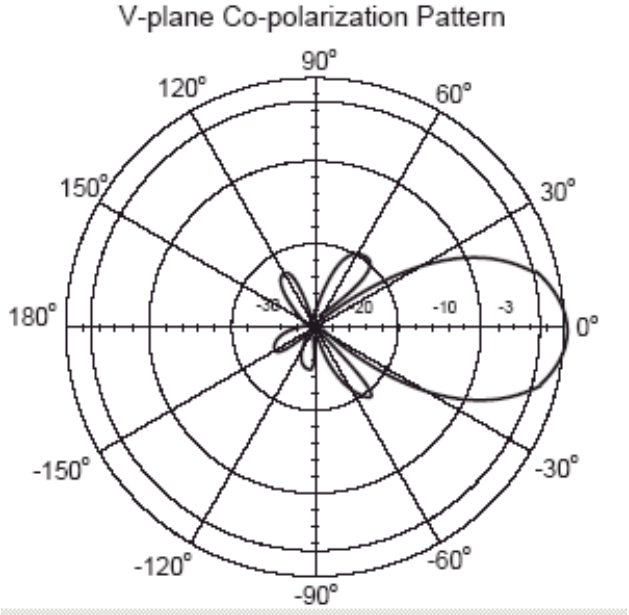
Environmental & Mechanical Characteristics



Survival wind speed	216 km/hr
Temperature	– 40 degrees C to +80 degrees C
Humidity	95% @ 25 degrees C
Lightning protection	DC ground
Radome color	Light gray
Radome material	ABS, UV resistant
Weight	0.4 kg
Dimensions	200 x 200 x 50 mm

Pattern





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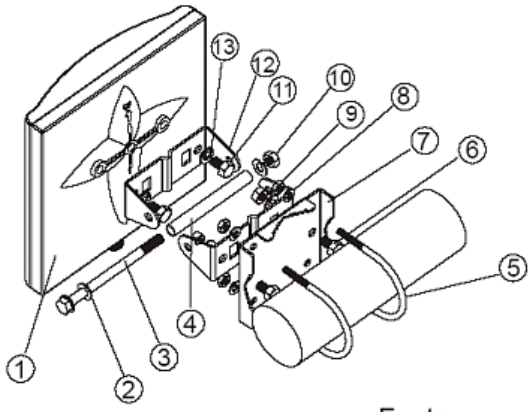
Mounting

Horizontal Mount

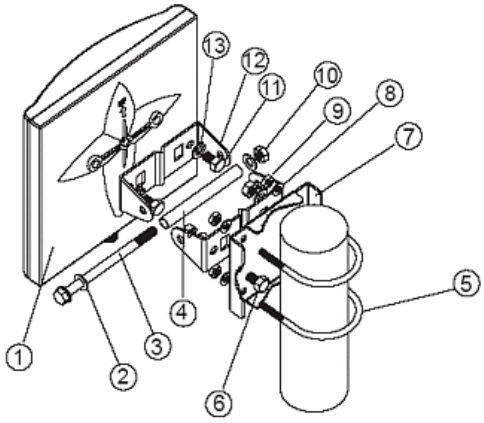


① Antenna body
② M8 washer - 3 pcs
③ M8x120 screw -1 pcs
④ Steel tube - 1 pcs
⑤ 2" U bolt - 2 pcs
⑥ M8 x 16 screw - 2 pcs
⑦ Adapter plate - 1 pcs
⑧ 1/4-20 UNC washer - 4 pcs
⑨ 1/4-20 UNC nut - 4 pcs
⑩ M8 nut - 3 pcs
⑪ M8X12 screw -2 pcs
⑫ M-type stand - 2 pcs
⑬ M8 spring washer - 3 pcs

Features:
1) Horizontal Pole Mounting, Vertical Pole Mounting All-in-One feature!
2) Down-tilt capability

Note:
a. Please mount the antenna on the pole of max 2" diameter.
b. Do not place the antenna up-side-down and always use it at vertical polarization to allow draining of moisture.

Vertical Mount



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High Gain Panel Directional Antenna for 2.4 GHz

General Description

The 12 dBi window antenna is a high-gain antenna for the 2.4 GHz frequency band. This antenna is typically used in combination with a Subscriber Unit.

Mounting Instructions

Package contents:

- ANT24-1200 Antenna
- Extension Cable (3m)
- Mounting Kit
- Quick Installation Guide

Wall Mount for Outdoor/Indoor Application

A. Insert the plastic wall plug (2) into the wall

B. Insert the screw (3) into the plastic wall plug through the antenna mounting hole and tighten

Window Suction Mount for Indoor Application

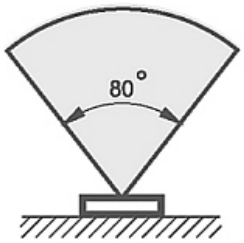
A. Insert the window suction cup through the antenna mounting hole.

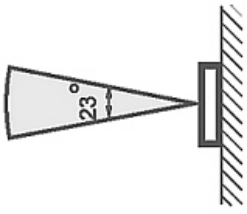
B. Turn the suction cup one quarter to lock it into position.

C. Press the window suction cup onto the window glass.

1. Antenna body
2. plastic conical anchor
3. screw
4. window suction cup

Coverage





Note: The bulged side of the antenna must point to the Base Station.

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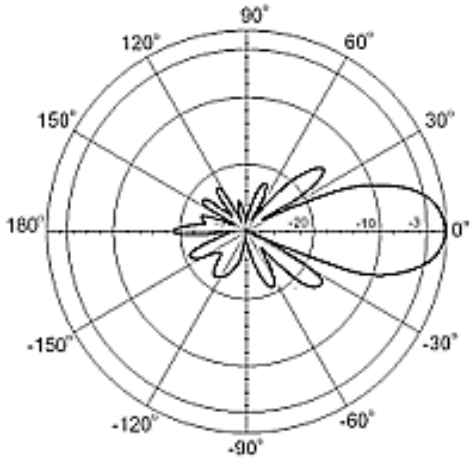
Hardware Specifications

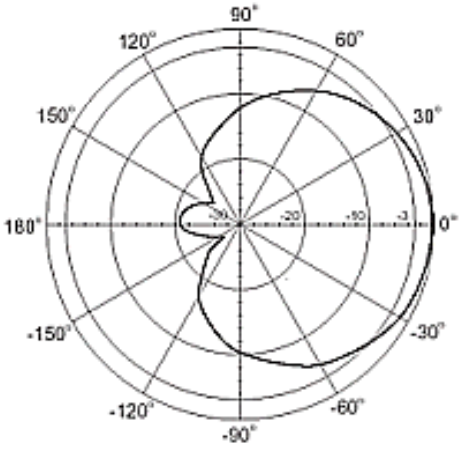
Electrical Specification	
Frequency range	2.400 – .2484 MHz
Gain	12 dBi
VSWR	2.0 : 1 Max.
Polarization	Linear, vertical
HPBW / horizontal	84 degrees
HPBW / vertical	23 degrees
Front to back ratio	18 dB
Downtilt	0 degrees
Power handling	20 W (cw)
Impedance	50 Ohms
Connector	N-Jack
Cable	ULA-168; 200 cm
Cable loss	1.3 dB
*Exclusive of cable loss	

Environmental & Mechanical Characteristics	
Survival wind speed	180 km/hr
Temperature	-40º C to +80º C
Humidity	95% @ 25º C
Lightning Protection	DC ground
Radome color	white
Radome material	ABS, UV resistant
Weight	0.6 kgw
Dimensions	330 x 93 x 21 mm

Pattern



Vertical



Horizontal

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PARABOLIC ANTENNAS

24 dBi Directional Parabolic Grid Antenna

General Description

The Tsunami 24 dBi Directional Parabolic Grid Antenna is a broadband antenna for the 2.4 GHz frequency band.

The grid-type antenna allows either horizontal or vertical mounting on an antenna mast with an outside diameter of up to 51 mm (2 in).

This antenna typically is used in combination with a Subscriber Unit.

Note: The 24 dBi Directional Parabolic Grid Antenna is not allowed in countries that adhere to the ETSI radio regulations (also France).

In countries that adhere to the FCC regulations, use of this antenna is allowed only when operated with specific radio channels that can be set on the Tsunami MP.11.

Kit Contents

The 24 dBi Directional Parabolic Grid Antenna comes in two boxes with the following contents

Feed Box:

1 Feed assembly
1 Sub-reflector
1 #6 x 1/2 inch stainless screw
2 Stainless 1/4 x 20 hex nuts
2 Stainless lock washers
2 Stainless carriage bolts

Reflector Box:

2 Reflector halves
2 Stainless U-bolts
2 Mast clamps
1 Mounting ‘L’ shaped bracket
4 Keps nuts (4) #8-32 machine screws
6 Stainless 1/4 x 20 hex nuts
6 Stainless lock washers
2 Stainless carriage bolts
1 Stainless flat plate washer

Note: Prior to installation, or climbing the roof, verify if all parts and components are included. If any part is missing or appears to be damaged, consult your authorized Proxim Tsunami reseller.

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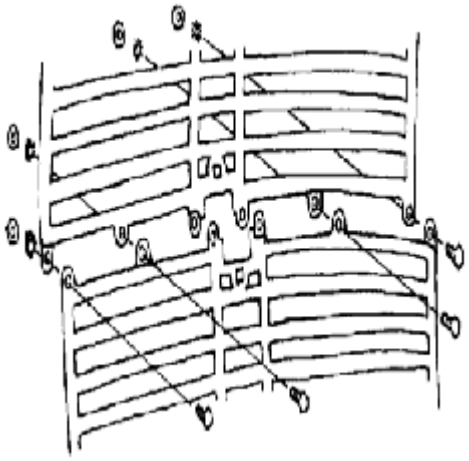
Assembling the Antenna

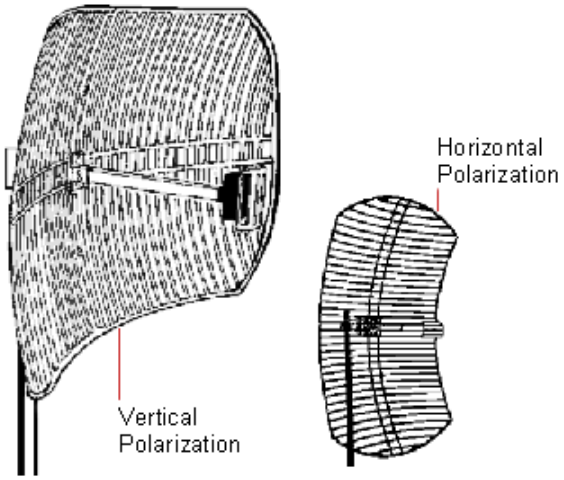
1. Assemble the two reflector halves inserting the four #8-32 machine screws through the front. Secure with the keps nuts on the back.

Note: Loosely tighten all hardware until completely assembled and then tighten securely.



Assemble the Reflector

2. Place the sub-reflector on the front of the feed and secure with the #6 x 1/2 inch stainless screw.
3. Determine the polarity of the antenna (see the following figure).
   - Horizontal polarity, (the reflector ribs and the sub reflector at the front end of the antenna are aligned horizontally).
   - Vertical polarity: (the reflector ribs and the sub reflector at the front end of the antenna are aligned vertically).



Determine Polarization

Polarity of the antenna must always be the same as the polarity of the antenna on the opposite side of the link!

4. Place the 'L' bracket on the back of the antenna.
5. Insert two carriage bolts from the front to attach.

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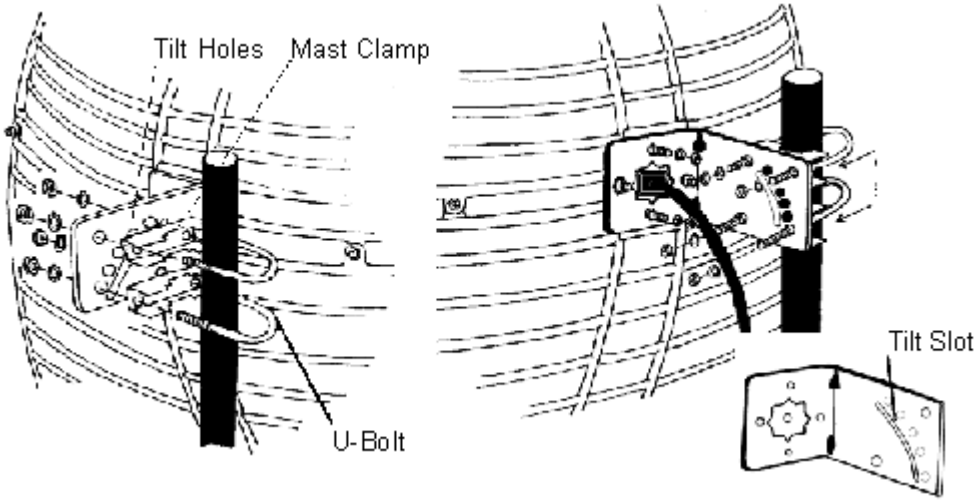

Attach Mounting Bracket

6. Secure on the back with the lock washers and nuts.
7. Recheck the dipole feed assembly for the proper polarity.
8. Attach the feed on the front with 2 carriage bolts. Secure on the back with the lock washers and nuts.

Mounting the Antenna

DANGER! Installation of antenna near power lines is dangerous! Before you proceed, make sure you have read and understood the safety precautions.

1. Before climbing the roof, make sure you have:
   - The assembled antenna.
   - The U-bolts and mast clamps to mount the grid antenna to the mast.
2. Determine the desired alignment of the antenna:
   - For horizontal alignment you need both U-bolts and the 4 lock washers and nuts.
   - For tilted alignment, you use only a single U-bolt and two lock washers and nuts. This mounting method lets you mount the antenna with an elevation in 10 degrees increments.

CAUTION! Tilted alignment is not suitable for environments where the antenna is subject to high wind conditions.

3. Place the U-bolt(s) around the mast as depicted in the previous figure.
4. Slide the mast clamps over the U-bolts.
5. Slide the 'L' bracket over the U-bolts and fasten the grid antenna to the U-bolts using the lock washers and nuts.

Note: For tilted elevation mounting, use the flat plate washer on the adjustable tilt slot to mount and secure the antenna to the desired elevation angle.

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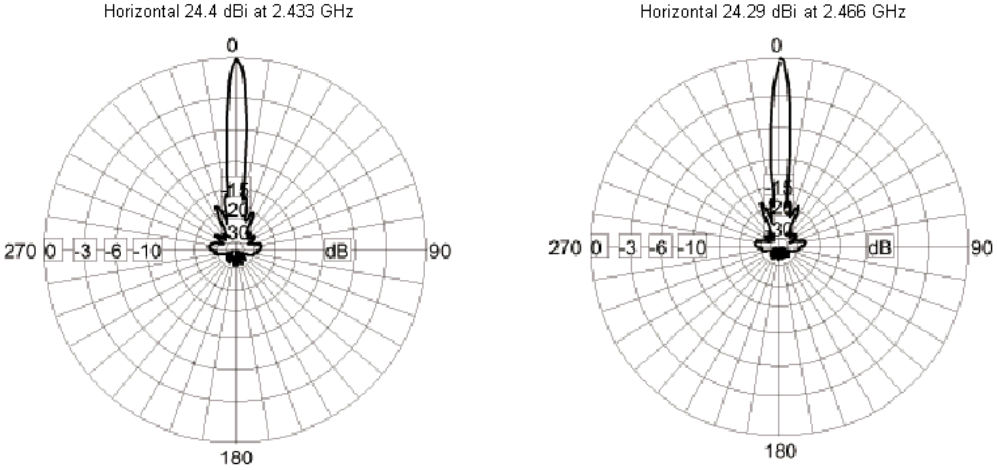
Technical Specifications

Mechanical	
Size (HxWxD)	61.0x91.4x38.1 cm (24x36x15 in)
Mounting method	Clamps to vertical mast with outside diameter between 26 mm (1.102 in) and 51 mm (2.0 in)
Cable Type	RG-8A/U, 50 ohms low-loss coax
Cable Length	60 cm (24 in)
Cable Color	Black
Connector[1]	Standard N (female)
Electrical	
Frequency Range	2.400 – 2.484 GHz
VSWR	Less than 2:1 nominal
Nominal Impedance	50 ohms
Gain	24 dBi
Polarization	Linear vertical for standard mounting Horizontal when mounted differently (see “Mounting the Antenna” on page 55)
Half-Power Beamwidth (at vertical polarization)	
Elevation Plane (vertical)	10 degrees
Azimuth Plane (horizontal)	6.5 degrees
Antenna Environment	
Operating Temperature	-40 degrees C (-40 degrees F) to +60 degrees C (+140 degrees F)
Wind/survival (mph)	At least 200 km/h (124 mph)[2]

[1]See also “Selecting the Correct Connector Type”.
[2]At least 100 km/h (62 mph) with 1.25 cm (0.5 in) ice.

Horizontal Pattern



Azimuth Plane (Horizontal), 24 dBi Directional Parabolic Grid Antenna

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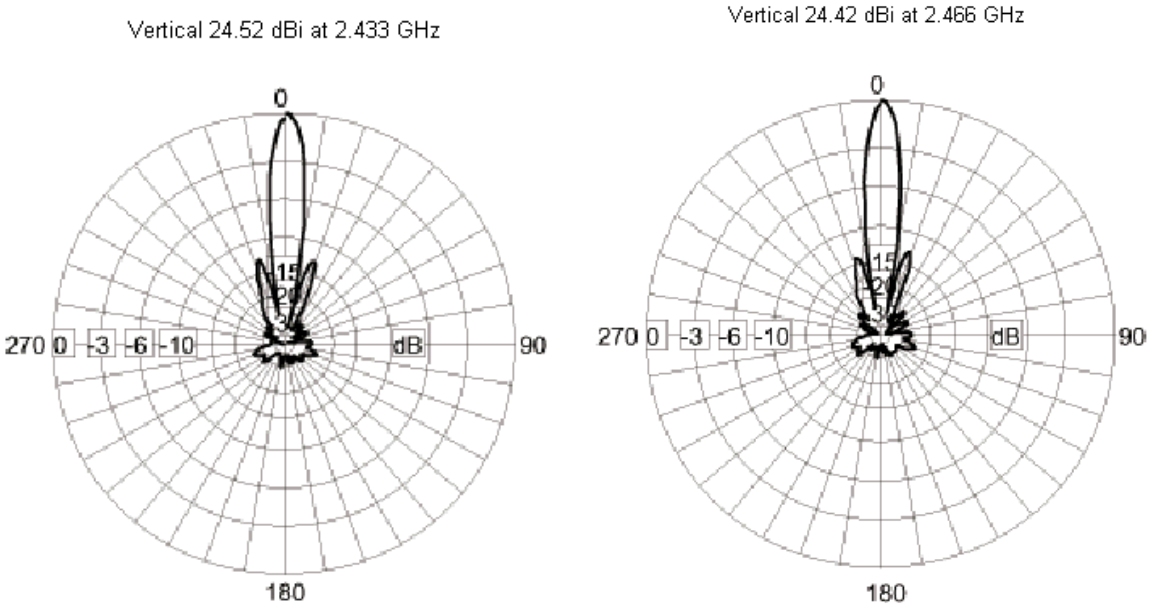
Vertical Pattern



Elevation Plane (Vertical), 24 dBi Directional Parabolic Grid Antenna

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Technical Support

If you are having a problem using a Proxim WAN product and cannot resolve it with the information in the product documentation, gather the following information and contact Proxim Technical Support:

- What kind of network are you using?
- What were you doing when the error occurred?
- What error message did you see?
- Can you reproduce the problem?

Be sure to obtain an RMA number before sending any equipment to Proxim for repair.

To receive E-mail technical support, be sure to include the serial number of the product(s) in question. The serial number should be on the product and conform to the following format: ##AT######## or ##UT######## or ##R7########. We are unable to respond to your inquiry without this information.

USA & Canada Customers
Call Technical Support: WAN Toll Free
1-866-674-6626 or
408-542-5390
Hours: 6:00 AM to 5:00 PM M-F Pacific Time
LAN Toll Free
1-866-674-6626 Hours: 24x7

International Customers
Call Technical Support:
WAN 408-542-5390
Hours: 6:00 AM to 5:00 PM M-F Pacific Time
LAN 408-542-5390 Hours: 24x7

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